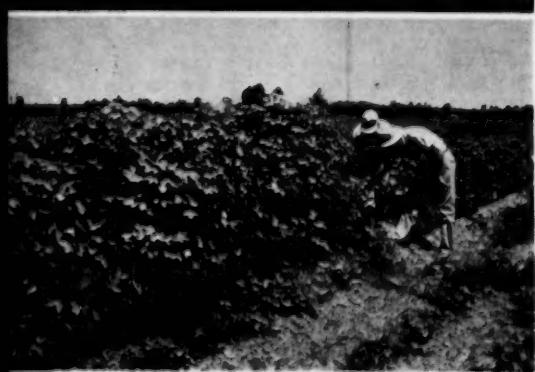


Chemical Week

January 29, 1955

Price 55 cents



Says one firm: 'fun' fringe benefits buy a bargain in workers' goodwill p. 29

► Exports to Latin America bulk large for U. S., but Europe draws a bead on markets p. 38

Gamma irradiation opens a new frontier in commercial chemical processing p. 48

Punched cards carrying engineering data speed custom design of equipment p. 58

► Nematodes wreak havoc on crops, create a multimillion-dollar nematocides market p. 83

NOW!



LIQUID CAUSTIC POTASH

in Non-Returnable Drums

No Deposit

Re-usable



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dioxide, those relating to new or unusual uses, receive special attention in our research laboratories. So if your chemical process includes bleaching, acidifying, purifying, fumigating, reducing, or preserving, investigate the advantages of using Ansul liquid sulfur dioxide. Write ANSUL CHEMICAL COMPANY, Dept. C-14, Industrial Chemicals Division, Marinette, Wisconsin.



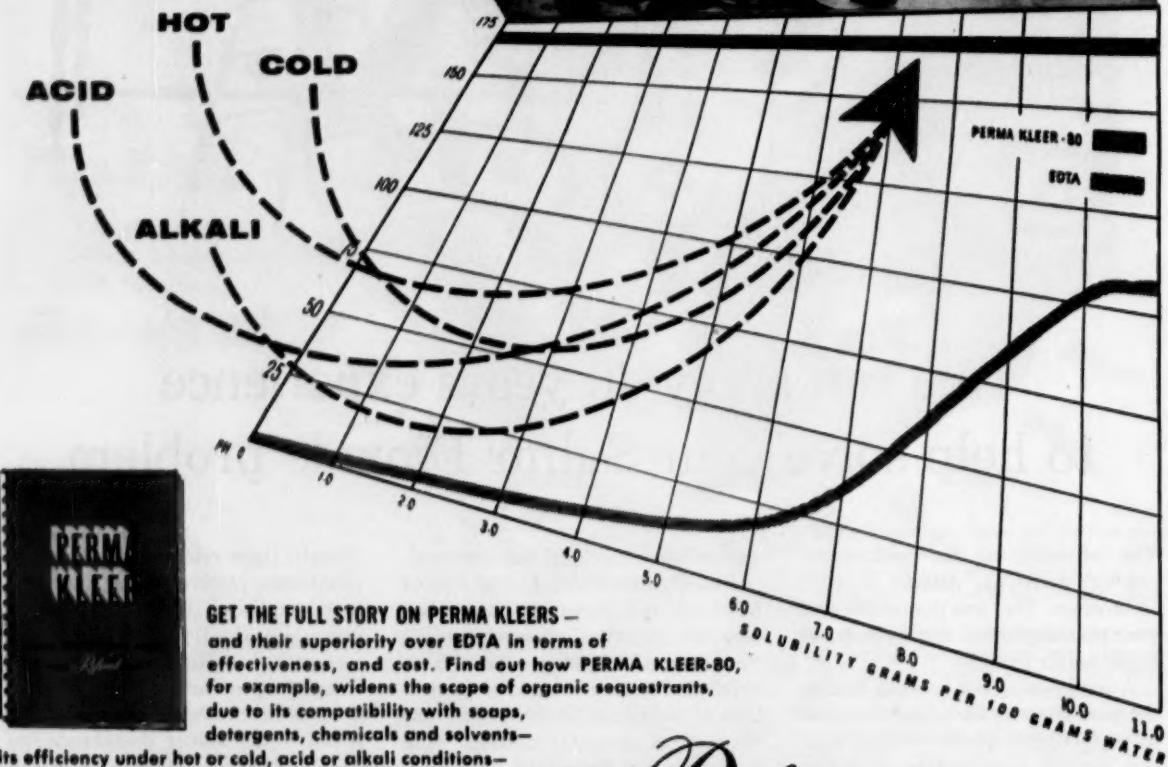
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OPINION . . .

WHICH *Figure Tyhe*
IS YOUR FORMED PRODUCT?

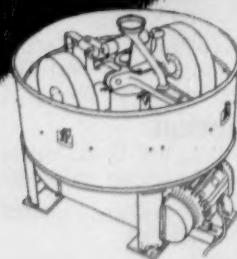
Angular?



Dish?



Hourglass?



with SIMPSON MULLING all shapes are fashionable

The formed products shown above are about as unlike in use and method of forming as are the Paris fashions from one generation to the next—but like ladies' apparel, they have one thing in common . . . they must be designed and produced to fit.

Whether they're extruded, pelletized, briquetted or cast, formed products must be thoroughly, *intimately* mixed to insure uniform dispersion of moisture and binder. Lack of proper dispersion means poor green strength or resistance to deformation and breakage . . . rejects, if discovered prior to firing and trouble in the form of porosity, poor finish and shrinkage, if discovered after firing.

The photos have another thing in common—they're all selected from an *impressive* collection of tough jobs solved through controlled mulling in a Simpson Mix-Muller. If you mix . . . and it's dry but not a powder, wet . . . but not a fluid, it will pay you to find out why Simpson mulling is more economical, certainly more efficient than any ordinary mixing method you may now employ.

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Transposed Titles

TO THE EDITOR: Your Forecast for '55 issue (Jan. 1) vividly points up some crucial needs that are a challenge to the chemical industry . . .

We appreciate, too, your quoting our Dr. Frank J. Soddy . . . However, you identified him as president of Chemstrand; actually, he is vice-president and director of research and development . . .

He is president though, of the Southern Association of Science and Industry . . . that's probably how you came to mistle him . . .

BOB BRIGHAM, JR.
Director of Public Relations
Chemstrand Corp.
Decatur, Ala.

By Subpoena

TO THE EDITOR: In your news article "Time Out for the Defense" (Jan. 1, p. 14) you report that among the witnesses for Carter were officials of Du Pont's "Kinetic" Chemicals Division.

We would like to emphasize that the witnesses from Du Pont appearing at the trial were *subpoenaed* to testify . . .

The Du Pont Co. does not take sides in a suit of this kind . . .

T. D. JOHNSON, JR.
Manager-Aerosol Propellant Sales
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

Peroxide/Sulfuric

TO THE EDITOR: Congratulations on an excellent account of our *in situ* epoxidation process (Dec. 25).

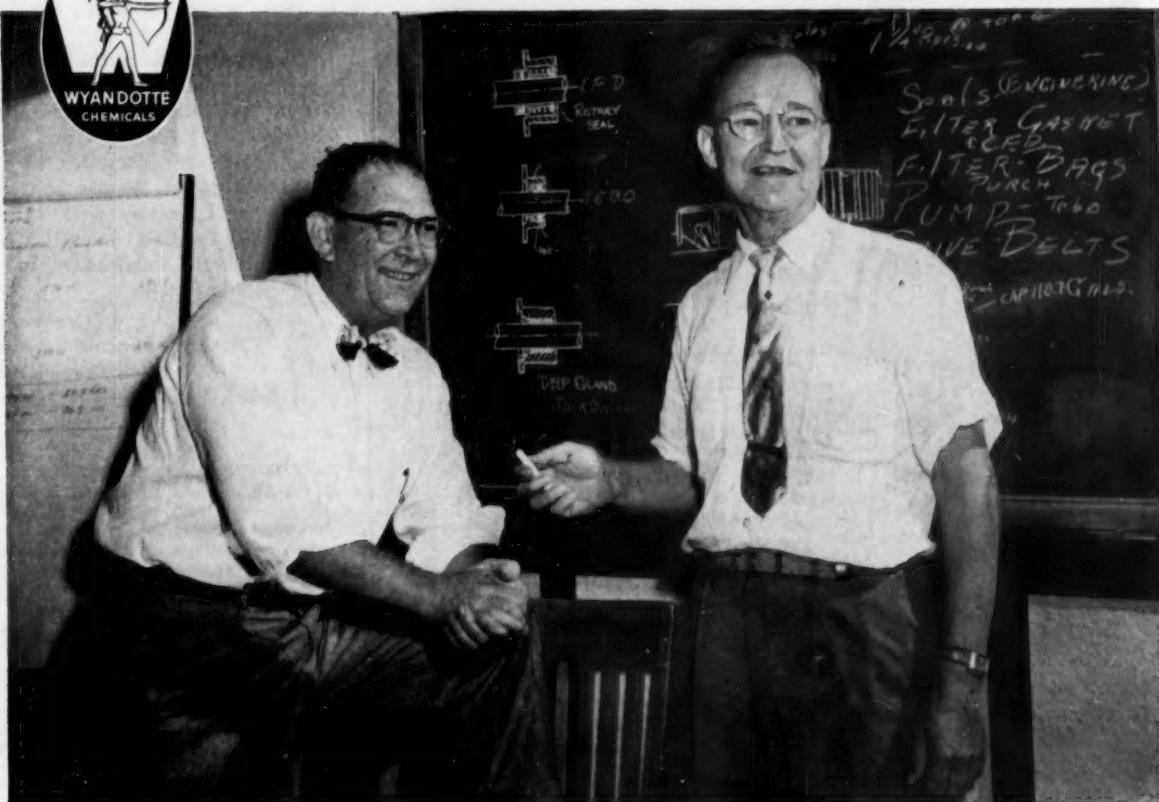
However, in your description of a typical run, the figure recorded for 50% sulfuric acid is in error and is actually the 50% hydrogen peroxide figure. The charge for the representative run illustrated should read 2000 lbs. soybean oil, 400 lbs. hexane, 320 lbs. acetic acid, 44.8 lbs. 50% sulfuric acid and 796 lbs. 50% hydrogen per-

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
W. A. Jordan, Chemical Week, 330
W. 42nd St., New York 36, N. Y.



Dependable Source for Chemical Raw Materials



Dr. W. L. McCracken (left), director of research for the Detrex Corporation, works out a cleaning equipment problem with Vice President C. F. Dimley.

Detrex, pioneer in cleaning products, is benefiting from the Pluronics. Are you?

As pioneers in the cleaning field, developers of the fabulous new ultrasonic process for production cleaning, and one of the foremost makers of cleaning equipment, Detrex Corporation, Detroit, Mich., is well qualified to evaluate the various raw-material ingredients that go to make up quality cleaning compounds.

"We have found Wyandotte Pluronics valuable in our alkaline cleaning preparations as well as in other formulations used for the preparation of metal surfaces," says Dr. W. L. McCracken, Detrex director of research. "We particularly like them for their non-foaming qualities in alkaline-type metal cleaners. They also provide in-

creased detergency, have free rinsing characteristics, and give the formulations stability over a wide range pH. By introducing the Pluronics in some of our products, we eliminated the need for anti-foaming agents and, at the same time, saved a lot of service work.

"We have found Wyandotte heavy chemicals and Wyandotte service most satisfactory over the years," states Dr. McCracken.

Whether you make metal cleaners or mechanical-dishwashing compounds, you will find the Pluronics* are not just another series of non-ionics. Actually, they are so unique, so different that, unless your evaluation takes in their over-all advantages and better all-around

balance, you may not have visualized their full potential. If you are not already using the Pluronics, write us for data and free samples, giving as much detail on your projected use as possible. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

* REG. U.S. PAT. OFF.

 **Wyandotte**
CHEMICALS

HEADQUARTERS FOR ALKALIES

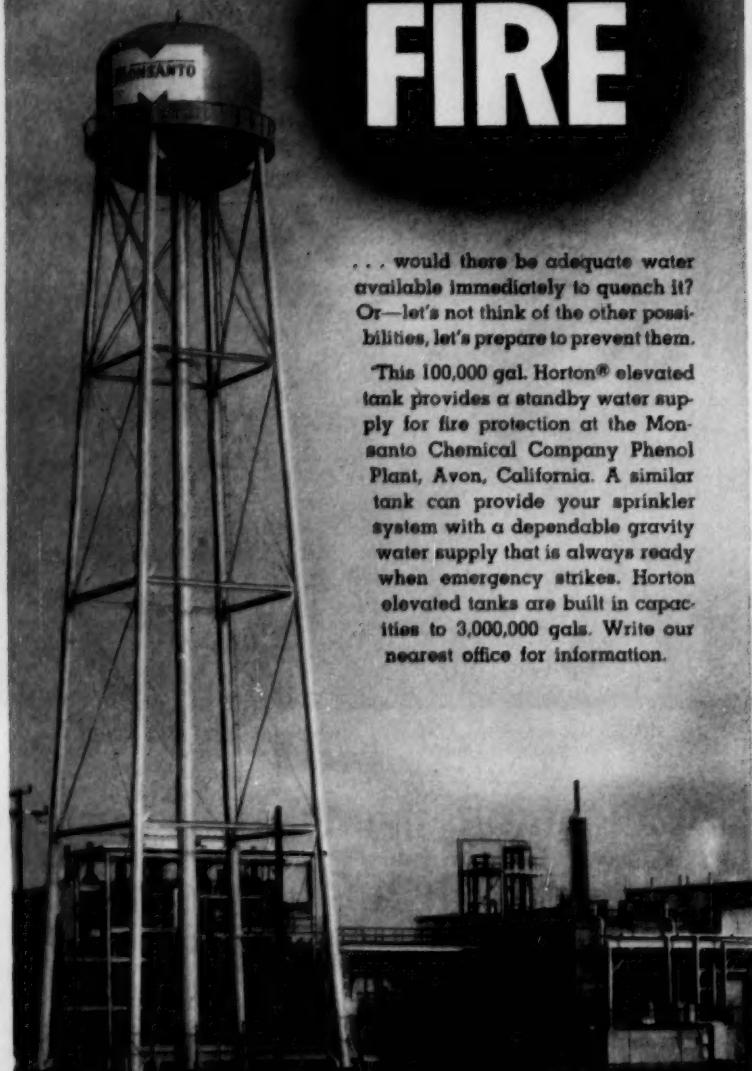
Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
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... would there be adequate water available immediately to quench it? Or—let's not think of the other possibilities, let's prepare to prevent them.

This 100,000 gal. Horton® elevated tank provides a standby water supply for fire protection at the Monsanto Chemical Company Phenol Plant, Avon, California. A similar tank can provide your sprinkler system with a dependable gravity water supply that is always ready when emergency strikes. Horton elevated tanks are built in capacities to 3,000,000 gals. Write our nearest office for information.



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OPINION

oxide, with the latter added gradually to the reactor over a two-hour period . . .

You say that this is the first time this process has been discussed publicly; that's certainly true, of course, with respect to the scope and thoroughness of your discussion of our production process. We did, however, outline our laboratory work at the Kansas City meeting of the ACS last March and at the American Oil Chemists Society in October . . .

F. P. GREENSPAN
Manager, Organic Research
and Development
Buffalo Electro-Chemical Co., Inc.
Buffalo, N.Y.

DATES AHEAD . . .

Instrument Society of America, symposium on methods of instrumental analysis, Auditorium of the Western Society of Engineers, Chicago, Feb. 7-8.

American Management Assn., marketing conference, Hotel Statler, New York, Feb. 7-9.

Chemical Institute of Canada, protective coatings division conference, Royal York hotel, Toronto, Feb. 24; Ritz Carlton hotel, Montreal, Feb. 25.

Drug, Chemical and Allied Trades section of the N.Y. Board of Trade, annual dinner, Waldorf-Astoria hotel, New York, March 3.

National Farm Chemurgic Council, annual chemurgic conference, Deshler-Hilton hotel, Columbus, O., March 22-24.

World Plastics Fair and Trade Exposition, National Guard Armory, Los Angeles, April 6-10.

American Drug Manufacturers Assn., annual meeting, Boca Raton Club, Boca Raton, Fla., April 13-14.

Conference on Biological Waste Treatment, Manhattan College, New York, April 13-15.

The American Oil Chemists' Society, annual meeting, Roosevelt hotel, New Orleans, April 17-20.

American Institute of Chemical Engineers, national meeting, Shamrock hotel, Houston, May 1-4.

American Pharmaceutical Assn., annual convention, Miami Beach, Fla., May 1-6.

Society of the Plastics Industry, annual meeting and conference, cruise on the Queen of Bermuda, May 7-15.

Chemical Specialties Manufacturers Assn., midyear meeting, Drake hotel, Chicago, May 15-17.

U.S.I. CHEMICAL NEWS

Jan. 29.

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★ 1955

NEW NATIONAL DISTILLERS' AMMONIA PLANT NOW ON STREAM

National Distillers Announces 3 Appointments In Chemical Division

Three appointments highlighting the integration of all National Distillers Products Corporation chemical activities into one division were announced this month by Dr. Robert E. Hulse, Director of the Chemical Division, and a Vice President of both National Distillers Products Corporation and its subsidiary, National Petro-Chemicals Corporation.

Lee A. Keane, Vice President of U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation, has been named Director of Chemical Sales, and will be in charge of the sales of all the corporation's chemical products.

Robert H. Cornwell has been appointed Director of Production, and will be responsible for production activities of all chemical plants of the corporation and its subsidiaries.

Dr. Stuart Schott has been named Director of Research, and will be in charge of the research division which will conduct research and pilot plant operations for the entire corporation and its subsidiaries.

New "Argon Grade" of Metallic Sodium Seen Key to New Metals

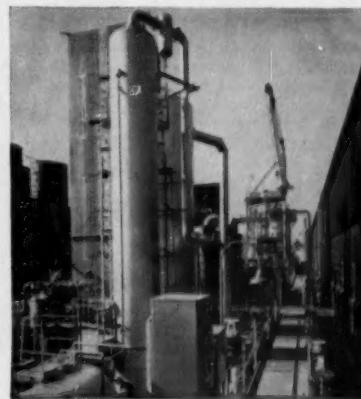
"Argon Grade" Metallic Sodium is a recently developed form of sodium which is produced, specially filtered and packed in an atmosphere of argon gas. Sodium protected in this manner is recommended for use where traces of dissolved gases such as oxygen and nitrogen are undesirable.

Development and commercial availability of this new product have been announced by the Chemical Division of National Distillers Products Corporation. This is the most recent step in National's program for developing forms and grades of metallic sodium which are easy to use and acceptable for a wide scope of industrial applications. Typical of this pioneering are earlier announcements on Sodium Dispersions and High Surface Sodium for many other uses.

For years the metal industry has benefited from the use of metallic sodium as a reaction tool. Used in an early commercial process for aluminum and more recently for rapid, efficient descaling operations in the production of stainless steel and other metals, sodium today points the way to new or improved methods for producing titanium, zirconium, silicon, tantalum, hafnium, etc. With the help of this versatile element, ductile metal and finely divided metal powder catalysts can be made from metal salts and oxides. For more information on adapting sodium to your needs, write Editor, U.S.I. Chemical News.

Capacity of 60,000 Tons Per Year to Help Meet Growing Needs of Midwest Agriculture, Industry

January 21 marked the opening of National Distillers' new \$7 million synthetic ammonia plant at Tuscola, Illinois—the most recent step in National's long-range program of growth and development in the chemical field. This new plant which will produce ammonia from "off-gas" from a hydrocarbon cracking operation, is the largest of its kind in the United States. It will have a capacity of 60,000 tons of ammonia per year by mid 1955 and will produce anhydrous ammonia and a variety of nitrogen solutions for the expanding agricultural and industrial markets of the Midwest.



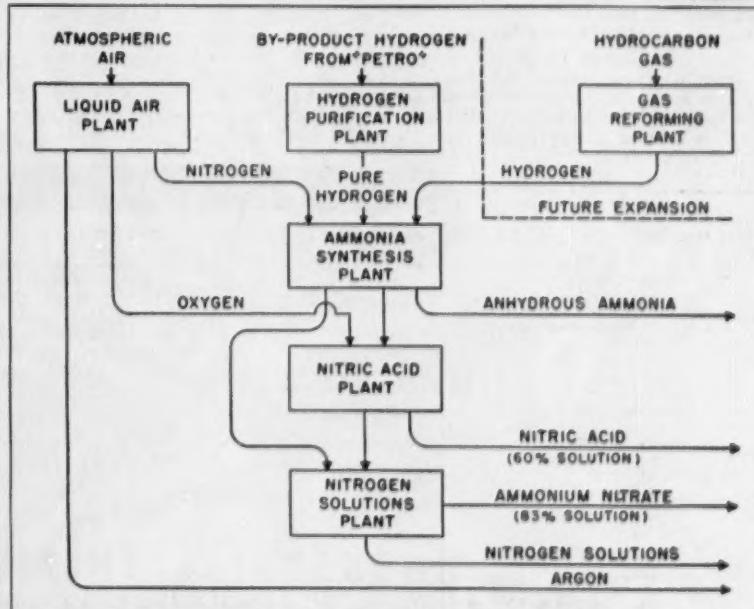
Shown here are the nitrogen wash column and the cold box of the air separation unit.

Uses By-Product Hydrogen

While hydrogen for most ammonia plants is obtained through "reforming" of natural gas, National Distillers has a ready-made source of supply—a hydrogen-rich "off-gas" from cracking operations at National Petro-Chemicals Corporation's ("Petro") huge ethylene plant located on adjacent property.

Nitrogen is obtained by air liquification and fractionation, with by-product oxygen being used in other processing operations. Studies by National's technical staff indicate that the use of by-product hydrogen is more economical than decomposition of natural gas from a standpoint of capital investment and production costs.

MORE ➤



Simplified flow diagram of the National Distillers' synthetic ammonia plant in Tuscola, Ill.

Jan. 29.

1955

U.S.I. CHEMICAL NEWS

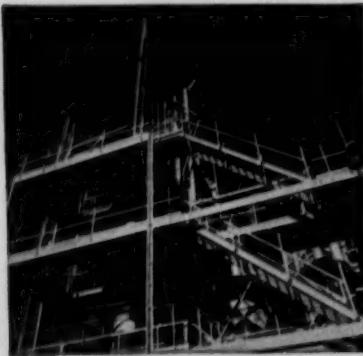
CONTINUED

New Ammonia Plant

Nitrogen Solutions

The nitrogen solutions are obtained by converting a part of the ammonia to nitric acid. The nitric acid is reacted with more ammonia to yield ammonium nitrate solutions. A variety of nitrogen solutions will be "custom-made" to satisfy the customer's requirements with respect to nitrogen content.

Nitrogen solutions are used in the manufacture of finished fertilizer and also for direct



Ammonia converter installation at National's new 60,000 ton a year ammonia plant.

application to the soil. National has storage facilities for anhydrous ammonia and nitrogen solutions to take care of some seasonal fluctuations in the demand for these products.

More Nitrogen Fertilizer Used

Consumption of fertilizer nitrogen is increasing enormously in all Midwestern states, and by 1955 demand in this area is expected to exceed 300,000 tons, according to the U.S. Department of Agriculture. Tuscola, Ill., is located in the heart of this rich farming region and makes an ideal site for National's new plant — the first of its kind in that state.

Higher Yields

According to authoritative agricultural reports, an average of 10 pounds of nitrogen per acre was used in the corn growing areas during 1950. With this level of fertilizer nitrogen,

New Light on Methionine Boost to Fish Meal Rations

During recent studies on sulfur bearing amino acids, indole was found to have a growth-retarding effect on the animals tested. However, the researchers also found, that methionine conjugated or combined with indole in such a way as to render this growth-retarding action ineffective. Since high levels of indole are present in fish meal and its products of digestion, this deactivation of indole is thought to explain the beneficial effects obtained when methionine is added to rations containing high levels of fish meal. Indole and other types of toxic putrefactive compounds are built up in fish products when decomposition sets in before processing.

the average yield was 42 bushels per acre. According to these reports, application of 40 pounds of nitrogen instead of 10 increased the yield by 13 bushels per acre. At average farm prices this extra 30 pounds of nitrogen produced a profit over increased fertilizer costs of \$15.75 per acre or 420% return.

Increased use of fertilizer nitrogen gives proof that farmers and farm leaders are becoming increasingly aware of the profitability of higher nitrogen levels in fertilizer programs. National Distillers' facilities for producing raw materials for the fertilizer industry assures the Midwest of a dependable source of supply to meet these demands.

Emphasis on Raw Materials

In addition to the new ammonia plant, National has four Midwestern sulfuric acid plants with a combined capacity of over 1,000 tons of acid a day, much of which goes to the fertilizer industry. This is in keeping with National's intent to place greater emphasis on bulk industrial chemicals and to expand operations where the company has competitive advantages by virtue of low cost, integrated facilities, well situated as to markets. In addition, National has strongly emphasized that its policy is to produce *raw materials* for the fertilizer industry — not to manufacture finished fertilizer.

For further information on National Distillers' fertilizer chemicals write to Editor, U.S.I. Chemical News.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

A wide-spectrum "ideal" chemical (ethyl carbamate) with applications ranging from cancer therapy to the manufacture of plastics, reacts with organic and inorganic compounds to form intermediates or end products of commercial importance. (No. 1070)

Making corrugated cases easy to open, is the advantage of a new adhesive which seals cases securely during shipment and handling but still permits opening without struggle or use of knife. (No. 1071)

Moisture content of chemicals, clay, putty, and certain foods can be determined in less than 30 seconds according to the manufacturer of a new moisture tester. (No. 1072)

A floor tile with built-in adhesive on the back has been especially designed for do-it-yourself enthusiasts. Just strip off a plastic film and put the tile in place. (No. 1073)

Filtering compound for ultraviolet light, is reported to be particularly useful for sun-screen cosmetics. Safe for use on the skin, it is chemically stable, stable to ultraviolet light, and has excellent solubility. (No. 1074)

New lifting device for nonporous materials such as sheet metal, plate glass, etc., uses a vacuum cap that attaches to the moving object. Compressed air operating the hoist also creates the vacuum. (No. 1075)

A grease thickener said to make greases stand up better under high and low temperature operating conditions has been announced. Greases made with the new thickener have been boiled in water for days without breaking down. (No. 1076)

Oil for flushing mechanical vacuum pumps with risk of contamination from detergents or volatile additives is said to be ideal for removing old oil, sediment, and dirt which accumulates in the oil pump mechanism. (No. 1077)

Paint stripping and decarbonizing solvent works by cold immersion, is self-emulsifying, and according to the manufacturer, it strips paint and primers and cleans carbonaceous tars, coke and carbon varnish. (No. 1078)

New liquid metals pump has been developed which has no moving parts, uses electric current to do the pumping. As the current moves through the metal, it pushes the metal forward. (No. 1079)

PRODUCTS OF U.S.I.

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Butanol (Normal-Butyl Alcohol)
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Ethanol (Ethyl Alcohol)

Specialy Denatured—all regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
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Ethyl Ether, Absolute—A.C.S.

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Butyl Acetate
Ethyl Acetate—all grades
Normal-Propyl Acetate

OXALIC ESTERS

Diethyl Oxalate

OTHER ESTERS

Diethyl Carbonate
Diethyl Oxalate

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Acetoacetanilide
Acetoacet-ortho-chloroanilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloroanilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxaloacetate

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Calcium Pantetheone (Feed Grade)
Choline Chloride Products
Curby B-G® 80
DL-Methionine (Feed Grade)
Niacin, U.S.P.
Riboflavin Concentrates
Special Liquid Curby®
U.S.I. Vitamin B₁₂ and
Antibiotic Feed Supplements
Vocetone® 40
Vitamin A, D₃, and K₃ Products

OTHER PRODUCTS

Anhydrous Ammonia
Caustic Soda
Ethylene
Liquid Chlorine
Metallic Sodium
DL-Methionine (Pharm.)
N-Acetyl DL-Methionine
Nitrogen Solutions
Propionic Acid
Sulfuric Acid
Urethan, U.S.P.

*Reg. U. S. Pat. Off.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

99 PARK AVENUE, NEW YORK 16, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

NEWSLETTER

A multibillion-dollar investment by private industry in atomic development is foreseen by General Electric's Francis McCune. It will eventually match, he thinks, the government's investment (\$8 billion to date, an additional \$4 billion authorized).

He decries the notion that the Atomic Energy Act of 1954 is a "give-away" to private industry. "The new act maintains an almost complete government monopoly, but it still allows the AEC to let industry play . . . a relatively much more important role."

Watching out for the world's workers, the International Labour Organisation's Committee on Occupational Safety and Health has recommended that the ILO seek substitutes for arsenic, benzene and silicaceous materials in industrial processes, and for poisonous substances used in agriculture.

An advisory body with little real authority, the ILO can nevertheless urge its member groups—which do have authority—to put its recommendations into practice.

Also of international import are Dow Chemical's plans to set up a Dutch subsidiary to import, manufacture and distribute chemicals, plastics and magnesium.

To be known as Nederlandsche Dow Maatschappij N. V., the wholly owned subsidiary will be headquartered in Rotterdam, will start construction within a few months of a manufacturing plant, warehouse, tank storage and dock facilities on a leased 50-acre tract.

Chemical process firms in the Detroit area fear that they may be faced later this year—perhaps as early as April—with union demands for a "guaranteed annual wage."

There's little doubt that the auto workers will bargain for it, and may even strike to enforce their demands. (A popular interpretation of the current high output rate is that auto makers are building up stocks against such an eventuality.) And this kind of thinking is bound to permeate all labor-management negotiations in the area.

One chemical process firm, Cutter Laboratories (Berkeley, Calif.), got right into the middle of the anti-Communist fight when it fired Doris Walker, an allegedly Communist employee who was president of a union local before her discharge in 1949.

In a 4-3 decision upholding Cutter Labs (and reversing the arbitration board and a lower court), the state supreme court contended that the firm was within its rights in protecting itself from "sabotage, force, violence and the like"; but the dissenting minority, who intimated that Mrs. Walker was fired for union activities rather than for communism, maintained that the majority ruling deprives alleged Communists of their civil rights without due process of law.

Mrs. Walker's attorneys will likely appeal to the U. S. Supreme Court.

NEWSLETTER

In another legal imbroglio, the city of Deer Park, Tex., is renewing its attempt to annex, for taxing purposes, the 440-acre Shell Oil and Shell Chemical property with its \$27-million plants.

The state supreme court just turned Deer Park down (*CW Newsletter*, Jan. 15), but the city attorney has filed for a rehearing. So far the court has handed down six different opinions in the case, which hinges on Shell's contention that a city can't appropriate "uninhabitable land" for tax purposes.

The chemical process industries have an important stake in many of the bills introduced in the new Arkansas legislature:

- The new governor, Orval Faubus, recommended in his inaugural address that feed, seed and fertilizer be exempted from the sales tax. House Bills 11 and 43 embody that recommendation.
- House Bill 57 provides for the creation of four scientific and industrial study panels and formation of an industrialization panel composed of a hundred business leaders.
- House Resolution 1 proposes a constitutional amendment to exempt new industries from state, county and municipal taxes.
- Senate Bill 36 creates a state industrial development commission.

Freight taxes too high? Yes, says the National Conference for Repeal of Taxes on Transportation, chairman of which is Donald Ward, director of transportation, Olin Mathieson Chemical.

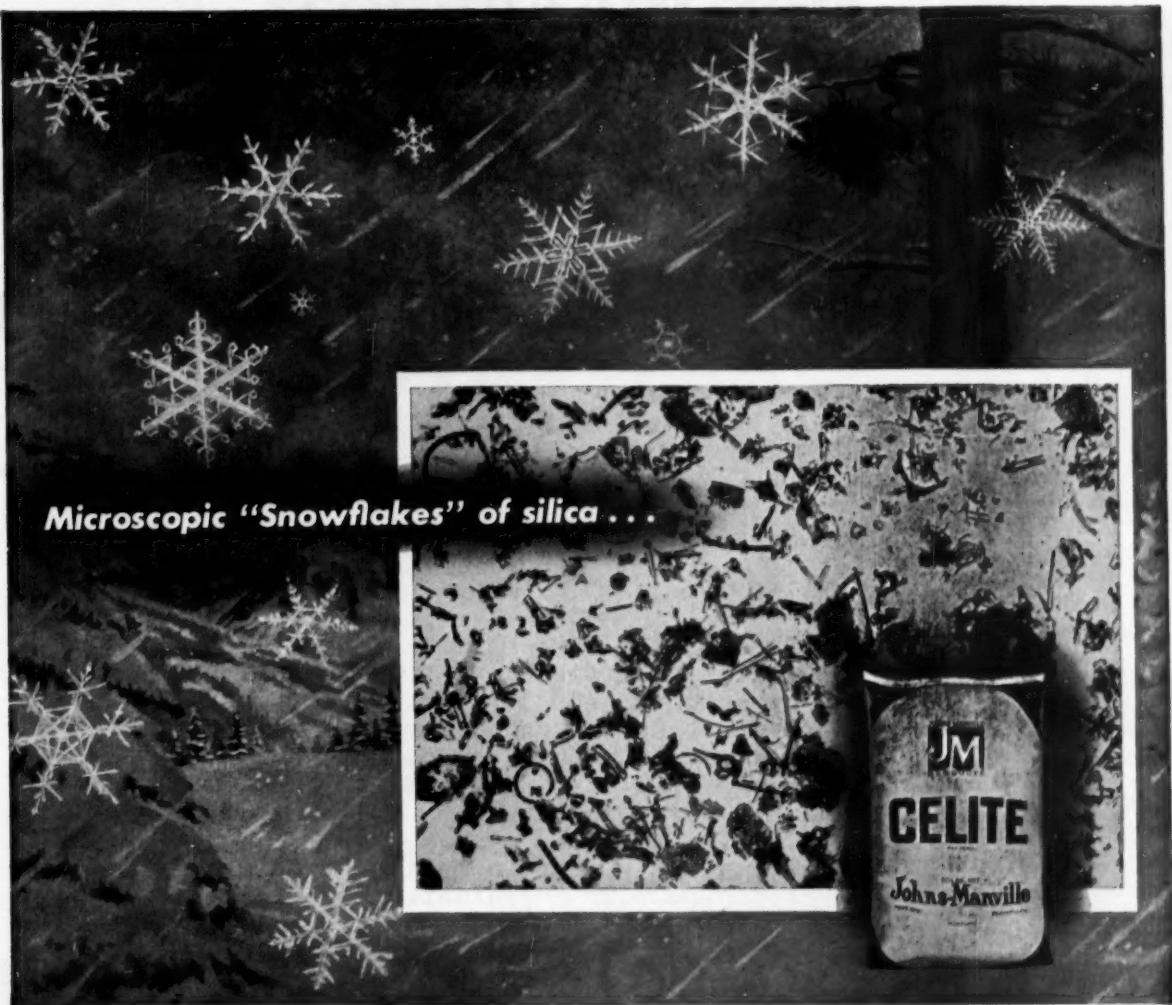
The conference, which met last week to plan strategy, seeks elimination of the 3% tax on freight movement as well as the 10% tax on passenger traffic. These taxes, says Ward, "discriminate against users of common carriers, discourage the use of such services."

Pollution polemics continue to plague the process industries:

- In Baltimore, residents of the St. Helena area charged that the Glidden Co.'s paint plant was still—after hearings last October—a nuisance and a health hazard. Health Commissioner Huntington Williams said there had been "sharp improvement," and that residents refused to admit it; the residents accused Williams of bias in favor of the company; company officials complained that they were victims of an assumption that all dust and odor in the large industrial area comes from their plant. Result: city officials have appointed two members of the Health Dept. staff to make a 60-day study.
- In Los Angeles, the Chamber of Commerce has called for a seven-member commission to replace the County Board of Supervisors as directors of the Air Pollution Control District. Their reasoning: the supervisors have too many other duties in running 54 departments.
- In England, a bill will be introduced in Commons next month to give effect to the recommendations of the Beaver Report on air pollution problems.

Happier note: Union Carbide and Carbon will, starting next fall, give 68 additional four-year undergraduate scholarships at 11 additional colleges and universities, making a total of 376 scholarships at 45 schools. The 11 new institutions: Cornell, Duke, Earlham, Haverford, Kenyon, Princeton, Randolph-Macon, Southwestern at Memphis, Stanford, Notre Dame and Pennsylvania.

. . . The Editors



Microscopic "Snowflakes" of silica . . .

Celite's diatomite structure steps up performance in paints—plastics—polishes . . . hundreds of other products

MICROSCOPIC PARTICLES of Celite* do a man-size job of stepping up performance for many of America's leading products. Here is how the unique structure of Celite Diatomite Powders may add more beauty, longer life, greater efficiency to *your* products, too.

For example, the spiny, irregularly shaped particles contribute surface characteristics which make them the outstanding flattening agent in paints. Again, because of their structure, Celite particles are widely used as a

mild, non-scratching abrasive in finest quality auto, silver and glass polishes. Or consider molded plastics, where the strength and durability of Celite particles add life and beauty to surface finish.

Moreover, Celite particles in mass have great bulk per unit weight, so they are invaluable for extending, dispersing or fluffing up dry powders. They have high absorptive capacity, too, so they keep powders free-flowing, they serve as a medium for shipping

or storing liquids in a dry form.

Which of the many Celite advantages can you use to build product performance or cut production costs? A Johns-Manville Celite Engineer will gladly discuss your problem, without obligation. For his services or more information, simply write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.


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**INDUSTRY'S MOST
VERSATILE MINERAL FILLER**

LION OIL COMPANY



EL DORADO, ARKANSAS

J. B. ROGERSON,
MANAGER OF MANUFACTURING

October 29, 1954

MANUFACTURING
DIVISION

LUMMUS

NOV. 1, 1954
C.A.B.

Mr. C. A. Barrere
Vice President
The Lummus Company
2707 Weslayan
Houston 6, Texas

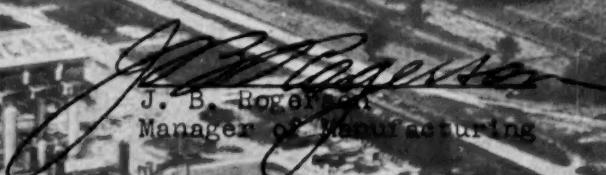
Dear Mr. Barrere:

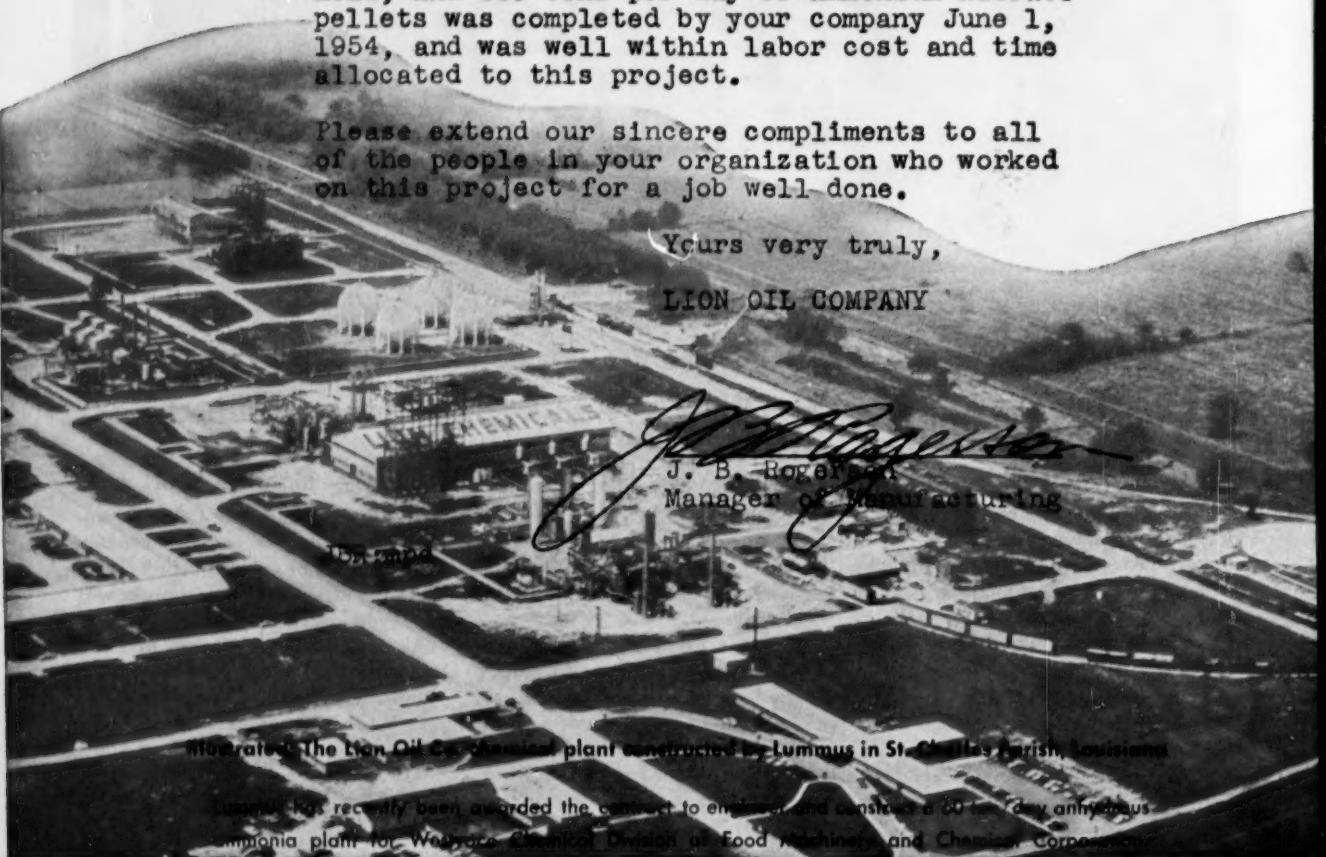
The construction of our chemical plant in St. Charles Parish, Louisiana, to produce 300 tons per day of ammonia, 450 tons per day of nitric acid, and 550 tons per day of ammonium nitrate pellets was completed by your company June 1, 1954, and was well within labor cost and time allocated to this project.

Please extend our sincere compliments to all of the people in your organization who worked on this project for a job well done.

Yours very truly,

LION OIL COMPANY


J. B. Rogerson
Manager of Manufacturing


Illustrated: The Lion Oil Chemical plant constructed by Lummus in St. Charles Parish, Louisiana.

Lummus has recently been awarded the contract to engineer and construct a 300-ton-day ammonia plant for Wallace Chemical Division of Food Machinery and Chemical Corporation.

THE LUMMUS COMPANY, 385 MADISON AVENUE, NEW YORK 17, N. Y.

DESIGNING ENGINEERS AND CONSTRUCTORS FOR THE PETROLEUM AND CHEMICAL INDUSTRIES

BUSINESS & INDUSTRY . . .



MCA'S EMMERICH: With chips down on tariff bill, he sets line for industry.

Throat-Clearing Time

Another day of decision is at hand in the nation's unending attempt to make up its mind on trade and tariff policies; and the chemical industry is clearing its throat this week preparatory to speaking its piece on this topic.

Among the 137 witnesses scheduled to testify for and against various phrases of the reciprocal trade extension bill now being considered by the House Ways & Means Committee in Washington, at least seven will be speaking directly for U.S. chemical producers; and their turns may come late this week.

With the chips down on this bill to continue the reciprocal trade program for another three years (including authority for the President to cut tariff rates by 5% each year in trade agreements), these chemical spokesmen are planning to discuss various aspects of how the industry stands to be affected by this bill. For example, one witness is to tell about current exporting practices of European producers.

Central Theme Set: While chemical management isn't unanimous on every detail in this bill—introduced by Ways & Means Chairman Jere Cooper (D., Tenn.) and designated H.R. 1—it's likely that much chemical testimony will closely parallel the policy line voiced by Allied Chemical's Fred Emmerich, chairman of the Manufacturing Chemists' Assn., in a public statement issued as committee hearings got under way last week.

The free world's greatest material asset, Emmerich declared, is the enormous industrial and agricultural strength of the U.S. He warned against adoption of tariff policies that would tend to weaken a vital domestic industry or destroy incentive to build new plants; and reminded that recognition of the importance of a strong chemical industry in the U.S. has been emphasized by government certification that \$3 billion worth of expanded chemical capacity since 1950 is essential to national defense.

In particular, Emmerich made it clear that MCA believes that changes in tariff rates on chemical products—when and if necessary—should be made only on an item-by-item basis, rather than by an across-the-board sweep.

Traders Speak First: First witnesses before Cooper's committee were all advocates of more international trade. Among these were officials of the Eisenhower Administration, such as Secretary of State John Foster Dulles; they all supported the bill, and two of them—Defense Secretary Charles Wilson and Foreign Operations Administrator Harold Stassen—even said they favored stepping up trade in non-strategic goods with the Communist countries, including Red China. Another early witness was Morris Rosenthal of the National Council of American Importers, who complained that the trade liberalization program seems "too little and too slow."

B. A. Rittersporn, Jr., executive director of the Committee on Foreign Trade Education of New York, was even more outspoken, warned that unless Congress acts to expand free-world trade "Japan and other Pacific areas may be enslaved by the Communists." Some Japanese officials recently have been making open passes at trade with the Soviets, he claimed; U. S. officials by their refusal to extend reciprocal trade would simply be offering tacit approval of the "enmeshment of Japan within the Red orbit."

Partly to counteract the publicity stemming from such testimony, Emmerich's statement urged that before authorizing any further reductions in tariff rates, Congress should await the Tariff Commission's recommendations in its pending study of present tariff classifications. (MCA has retained former Tariff Commissioner John Lee Coulter to help it in making suggestions to the commission on chemicals and allied products.)

While Emmerich's statement clearly indicates that MCA might be critical of various individual clauses, it does not point to any all-out opposition to the Cooper bill as a whole.

Will Congress Okay These Price Tags?

Plant Site and Purchaser	Product	Rated Capacity	Book Value*	Sales Price*	Plant Site and Purchaser	Product	Rated Capacity	Book Value*	Sales Price*
Los Angeles, Calif.					Baton Rouge, La.				
Standard of Calif.	Butadiene(1)	1,159	\$1,500	—	Esso Standard Oil	Butyl	47,000LT	\$9,378	\$14,857
Shell Chemical	Butadiene	61,000ST	4,061	—	Copolymer Corp.	Butadiene	23,000ST	1,470	5,000
Shell Chemical	Styrene	57,000ST	4,199	30,000	Copolymer Corp.	Gr-s	49,000LT	4,148	5,000
Shell Chemical	Gr-s	89,000LT	7,759	—					
Borger, Tex.					Louisville, Ky.				
Phillips Chemical	Butadiene	71,200ST	11,676	19,000	American Synthetic Rubber	Gr-s	44,000LT	4,298	2,340
Phillips Chemical	Gr-s	66,000LT	4,664	4,525	(Unsold Plant)	Butadiene	87,000ST	9,455	—
Houston, Tex.					Institute, W. Va.				
Food Machinery & Chem.	Butadiene	78,000ST	8,258	24,187	(Unsold Plant)	Gr-s	122,000LT	7,471	—
Goodyear Syn. Rubber	Gr-s	99,600LT	7,242	11,889					
Baytown, Tex.					Akron, Ohio				
Humble Oil & Ref.	Butyl	43,000LT	8,226	17,500	Firestone Tire & Rubber	Specialty			
Humble Oil & Ref. (Unsold Plant)	Butadiene	49,000ST	3,899	8,886	Gr-s	30,000LT	3,041	2,250	
	Gr-s	44,000LT	5,404	—	Goodyear Syn. Rubber	Specialty			
					Gr-s	15,200LT	3,550	2,075	
Port Neches, Tex.					Kobuta, Pa.				
Texas-U.S. Chemical and	Butadiene	197,000ST	12,028	53,000	Koppers Co.	Butadiene	128,000ST	12,676	2,000
Goodrich-Gulf Chem.(2)	Gr-s	89,400LT	7,277	11,500		(Alcohol)			
Texas-U.S. Chemical	Gr-s	90,000LT	9,694	13,000					
Goodrich-Gulf Chem.	{								
Lake Charles, La.					Naugatuck, Conn.				
Petroleum Chemicals, Inc.	Butadiene	60,000ST	3,704	16,000	U.S. Rubber	Specialty			
Firestone Tire & Rubber	Gr-s	99,600LT	7,697	11,650	Gr-s	22,200LT	4,078	3,200	
					U.S. Rubber	Dodecyl			
						Mercaptan	1,700ST	158	60

(1) Standard Oil (Calif.) produces crude butadiene which is later purified by Shell Chemical, is therefore included in Shell's total capacity.

(2) Jointly purchased.

* In thousands of dollars.

Hard to Turn Down

The three-man Rubber Disposal Commission wrapped up and sent to Congress this week a synthetic rubber sale package that will be hard to turn down.

Not only is the package one that will net the government some \$311 million in cash, but it also should broaden competition in styrene production—a strong argument in its favor, according to Justice Dept. standards.

With these two criteria—set by Congress back in 1953—substantially met, sale of the government's 12-year rubber monopoly is virtually assured. As one commission staffer admits: "The plants are as good as sold—as long as the U.S. doesn't become involved in a major war within the next few weeks."

Either the House or Senate can object (up until March 25) to the whole disposal or to any individual bid. Further: if either body vetoes any individual sale, any or all other purchasers may withdraw; and if less than 500,000 LT of Gr-s capacity or 43,000 of butyl are finally sold, all sales

are automatically voided, and the government must retain the industry.

But the possibility of any such move by Congress seems, at best, remote. Of the total \$311 million the government will receive, it will get \$260 million for the plant facilities themselves, plus an estimated \$26 million for supplies and "work in progress." Also included: some \$25 million in rubber inventory the government-owned plants will have on hand on the transfer date.

Only outside chance that the whole program may be upset is the possibility of a protest on antitrust grounds. While Attorney General Brownell gave his personal stamp of approval of each sale, it's obvious that in some cases his approval was tendered with extreme reluctance. On copolymer plants, for example, an over-all look at who bought what could nullify the sale of all units—since it was specifically required that the sale pattern provide a basis for the development of effective competition.

On butyl rubber there was a con-

dition, too. At least one of two plants had to be sold for disposal to become effective. Jersey Standard companies submitted the only bids on the two—if only one plant were sold to the company, it would precipitate a serious shortage of butyl rubber. So the sale of both was approved—but only because Standard has offered patent licenses and know-how to prospective producers outside the Jersey family.

Another antitrust worry is sale of the huge butadiene plant at Port Neches, Tex. Bought as a single unit, the plant gives 32% of total U.S. capacity to a single corporate group. But it was approved because the Disposal Commission concurs in the view expressed by the bidders "that there would be genuine competition between them under the scheme of operations contemplated."

Such statements clearly warn the chemical, rubber and oil companies that the Justice Dept. will be watching their future actions closely. Any departure from the assurances made orally or in sale contracts will be sure

grounds for antitrust court action.

No Hitch in Contract Closing: Assuming that Congress passes on the sale, there shouldn't be any hitch in actual transfer of ownership proceedings, however. The commission has 60 days in which to close its contracts; 21 of the new owners are present operators of the facilities they wish to buy.

No significant rubber price increase is expected as a result of the sale, either. Phillips Chemical has already set a 25¢ delivered price (up 0.9¢), and other producers are expected to follow suit shortly.

Good bet: the whole synthetic rubber sale will be in the lap of the anti-trusters by April 30.

Figures Tell

How desirable were the styrene and butadiene facilities to prospective purchasers? One indication is in the first offer made to the Rubber Disposal Commission. Here's a rundown (first name listed was the ultimate successful bidder; all figures in millions of dollars):

Butadiene, Port Neches, Tex.

Goodrich-Gulf-

Texas-U.S.	51.0
Allied Chem. & Dye	38.5
W. R. Grace	33.2

Butadiene, Houston, Tex.

Food Mach. & Chem.	11.0
Goodrich-Gulf	7.6
Goodyear	5.0
W. R. Grace	8.1
Sinclair Refining	16.0

Butadiene, Lake Charles, La.

Petroleum Chems.	15.1
Merck-Climax Moly.	10.1

Butadiene, Baytown, Tex.

Humble Oil & Ref.	7.9
Food Mach. & Chem.	6.6

Styrene, Los Angeles

Shell Chemical	27.0
(for three)	
American Chem.	13.5
Dow Chem.	12.5
Foster Grant	16.1
Hercules Powder	10.0
Heyden Chem.	6.3
Monsanto Chem.	5.8
Montrose Chem.	3.9
(plus production premium)	
National Lead	4.0

Showing Sharp Gains

Production of petrochemicals in the U.S. has increased heavily in recent years, but the country hasn't seen anything yet. That was the opinion of H. G. McGrath, associate manager of the M. W. Kellogg Co.—a Pullman Inc. subsidiary, speaking before a meeting of the American Institute of Mining and Metallurgical Engineers in New York last week.

Output of petrochemicals accounted for 25% (or 25 billion lbs.) of total U.S. chemical production in 1953, but by 1955 the output quota should jump to 32 billion lbs./year.

Moreover, pointed out McGrath, the value of petrochemicals is running well ahead of its production poundage record—now totals well over half of the value of total chemicals produced. By 1960 the dollar percentage could easily jump to 75%—or more.

Total assets of petrochemical producers now exceed \$3 million; domestic consumption of dyes, resins and plastics in the U.S. is over 95% synthetic; and over half the rubber and one-fifth of the textiles produced are of synthetic origin.

Further: when you look at the relative youthfulness of the petrochemical industry, the growth is even more spectacular, McGrath points out. Since 1939, it has expanded output "in constant dollars" three times; the industry ranks sixth just below automobiles in the hierarchy of the U.S. industry.



EISENHOWER: Offers no economic blueprints but exudes a . . .

Glow of Optimism

A tax cut for everyone next year, more tax adjustments to aid fast-growing companies, increased federal sponsorship of research and development—these are some of the ideas President Eisenhower has laid before Congress to assure the long-term growth of the U.S. economy.

His thoughts were offered in an annual economic message, which this year, for the first time, explained how Eisenhower thinks we can grow to a \$500-billion economy by 1965, compared with today's \$360 billion.

Throughout, his message avoided detailed blueprints. But it did stress the key role of more output per worker by means of new machinery and equipment—implementation of which would mean heavy dollar investment by chemical companies.

Eisenhower would like to see "barriers to the free flow of funds into risk-taking and job-creating investments," encouraged last year in the new tax law, further reduced next year. This could take the form of larger tax credits for income from dividends, and further liberalization of depreciation allowances.

Tax reductions for next year are not held out as a definite promise—but Eisenhower told Congress that a rise in revenues—as business improves during 1955—should make a general cut possible. Democrats may try to force a tax cut for individuals through the legislature this year, but the

BUSINESS & INDUSTRY

President's economic message made it plain the Administration will fight any such move. Reason: it wants business to share in any tax cut, to stimulate further expansion and investment.

Nod to Chemicals: The chemical industry's leading role in the 1954 business recovery of last year emerges in one of the tables included in the report.

It shows that while output of all U.S. industry declined 7% in 1954 compared with 1953, chemical output held even—was one of the leaders in the upturn that began in August. Chemicals gained 12% from August through December, double the gain of all industry.

The employment breakdown didn't show the same bright picture, however. From mid-1953, to mid-1954, employment dropped 35,000 in chemical and allied industries. From August to December, during the upturn, it rose only 3000.

The over-all outlook is certainly satisfactory, though, particularly in the face of a "gradually stabilizing foreign situation."

COMPANIES . . .

Freeport Sulphur Co., which plans to build a \$16-million potash mine and refinery in the Carlsbad, N.M., area, has asked the New Mexico land commissioner to work out a 360-acre land swap with the federal government. The tract Freeport wants is federally owned, hence not available for purchase.

Final approval has been granted to Liquid Carbonic Corp. by the Oakland Board of Port Commissioners to build a \$1.5-million carbon dioxide plant in Oakland. Construction will be started immediately; production is expected by late spring.

General Portland Cement Co. stockholders have approved a two-for-one split of the company's common stock. After the split, total shares outstanding will be over 2 million.

Union Chemical and Materials Corp. (Pittsburgh, Pa.) has been granted a charter of incorporation in Nashville, Tenn.; capital stock, \$27 million.

Minerals & Chemicals Corp. of America has filed a proposed offering of

435,934 shares of its common stock with the Securities & Exchange Commission. Gross value: over \$10 million. Of the total, 125,000 shares represent company financing; the balance will accrue to selling stockholders.

Northern Chemical Industries (Baltimore) has awarded the prime contract for its proposed nitrogen-ammonia plant at Searsport, Maine, to the Girdler Co. (Louisville, Ky.).

EXPANSION . . .

Refractories: Kaiser Aluminum & Chemical Corp.'s Chemicals Division will build a \$4-million plant in Columbiana, O., to produce basic refractories. Construction will start in April; operation is scheduled for late in the year. Chrome ore (necessary in production) will be imported by Kaiser from the Philippine Islands.

Cement: Peerless Cement Corp. will build a 1-million-bbls./year cement plant in Detroit. Completion is scheduled for late 1956 or early 1957.

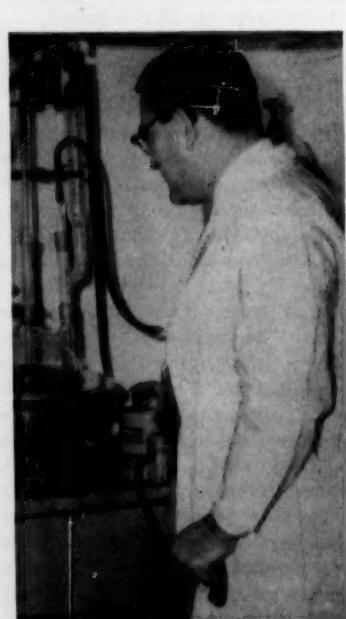
Potassium Sulfate: International Minerals & Chemical Corp.'s Potash Division will expand its potassium sulfate-producing facilities at Carlsbad, N.M., to 40,000 tons/year capacity.

Construction is expected to start immediately; the new units should be completed in time to make additional potassium sulfate available for the coming fertilizer season.

Ammonia: Despite repeated estimates that the ammonia supply in the Far West currently exceeds demand, Pennsylvania Salt Mfg. Co. of Washington (with plants in Portland, Ore., and Tacoma, Wash.) is assembling an anhydrous ammonia plant in Portland. The ammonia units will use by-product hydrogen from the company's nearby chlorine-caustic plant; capacity is reported unofficially at 15,000 tons/year.

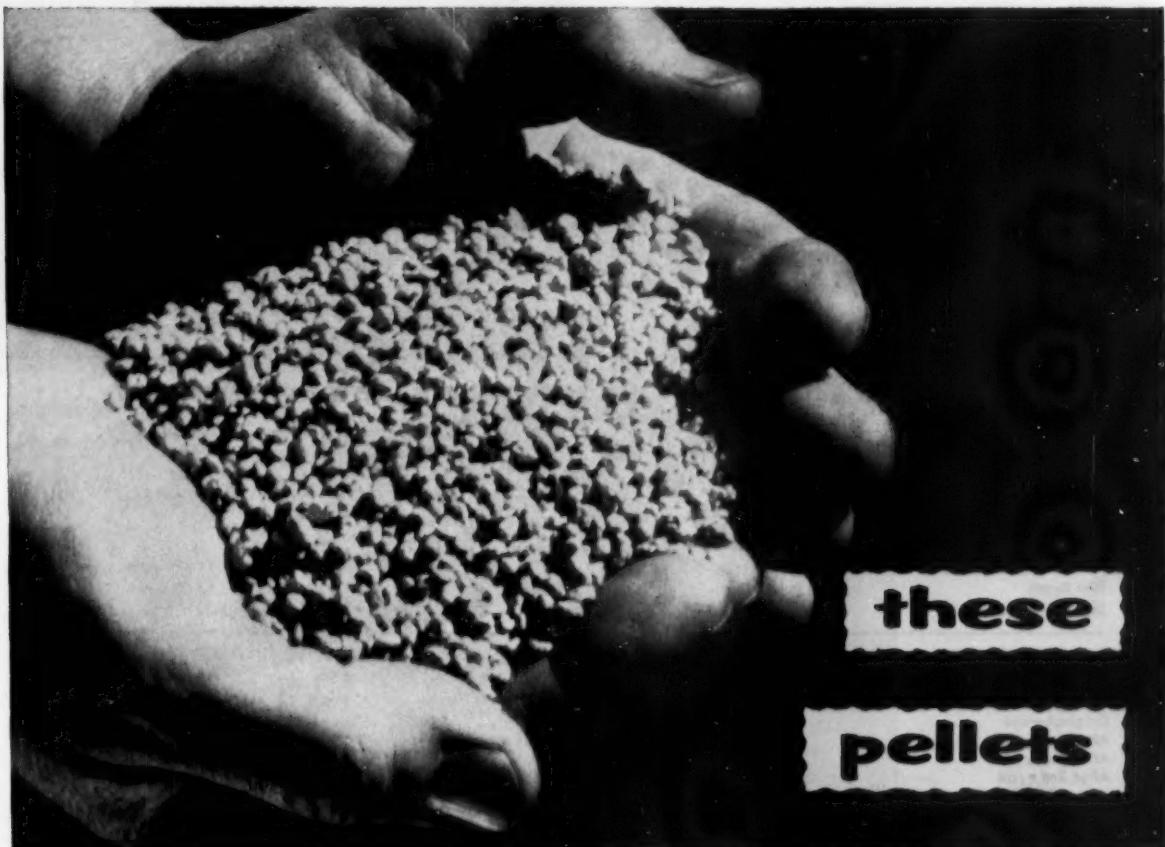
Antiknock Compounds: Ethyl Corp. will build a plant to produce antiknock compounds at Sarnia, Ont. It will be owned and operated by Ethyl Corp. of Canada, Ltd.

Cracking Catalysts: Davison Chemical Co., division of W. R. Grace & Co., will build a \$6-million plant at Valleyfield, Que., to produce synthetic fluid catalysts for petroleum cracking. To be run by Davison's wholly-owned subsidiary, Davison Chemical Co., Ltd., construction on the plant will start immediately; all raw materials will be purchased in Canada.



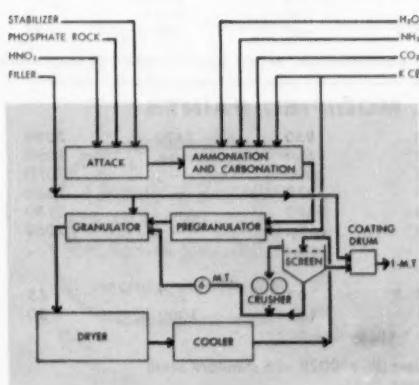
Meritorious Record

THIS YEAR the American Legion's Employ - the - Handicapped citation in New Jersey went to the Schering Corp. (Bloomfield), prescription drug manufacturer, first pharmaceutical company to be so lauded in the U.S. Judged on a basis of personnel practices—with credit given to companies that give job priority to veterans, disabled veterans, and other handicapped persons on a salary par with non-disabled persons—Schering received the award over close to 2000 other firms. Here one of the company's research chemists, disabled in World War II is seen supervising a laboratory synthesis. Next step: competition for the Legion's national award on a state-by-state basis.



**these
pellets**

could make you rich



PEC Patented Carbonitic Process

More than likely you're looking at complex fertilizer pellets for the first time. Each pellet contains balanced quantities of nitrogen, phosphorous and potash, although the units of plant food can be altered to suit the needs of any particular soil.

C&I has the exclusive right to license the PEC* continuous chemical, carbonitic process which produces this superior pelleted fertilizer. C&I will provide a complete and integrated plant or any of the individual units (ammonia, nitric acid, complex fertilizer) for the production of complex fertilizer in any desired capacity. Plants are erected at a fixed price with productions and efficiencies fully guaranteed.

There are still several choice plant-sites available where competition would not exist. Since new economic frontiers do not remain undeveloped for long, now is the time to consider complex fertilizer as an investment in the nation's fastest growing industry.

Specialists in



Processing Ammonia

* Potasse et Engrais Chimiques



THE CHEMICAL AND INDUSTRIAL CORP.

CINCINNATI 26, OHIO

ANOTHER QUALITY CHEMICAL BY

HERE'S WHAT TO LOOK

Property	Gen-Flo Latex
Viscosity—cps.	21
Residual Styrene %	0.03
Odor	Very Mild
Mechanical Stability %	0.03
Film Specs	Good
Stabilization System	Balanced

Gen-Flo Latex
21
0.03
Very Mild
0.03
Good
Balanced

COMPARATIVE LATEX PROPERTIES

Latex	A	B	C	D
21	18	77	14	
0.02	0.22	0.07	0.05	
Very Mild	Ammonia	Sour Sweet	Mild	
0.02	0.03	Creamed-Thickened	Custard	
Good	Poor	Fair	Excellent	
Balanced	Over Stabilized	Over Stabilized	Under Stabilized	

Tests	Freeze-Thaw Stability
Original—cps	860
After 1st cycle	760
After 2nd cycle	740
After 3rd cycle	700
After 4th cycle	650
After 5th cycle	900
Scrub to Failure	
24 hour dry	2000+
48 hour dry	2000+
Cleansability (strokes to remove)	
Crayon	41
Ink	20
Lipstick	100+
Mercurochrome	100+
Pencil	100+

Latex
A
B
C
D
21
0.02
Very Mild
0.02
Good
Balanced

NON-MODIFIED PAINTS

Control Paint
2000
2200
1850
1380
2010
2560

16 hours at -20° F. 8 hours at 77° F.

	2000+	2000+	2000+	2000+	2000+
Fed. Spec. TT-P-0029 with standard brush					

Fed. Spec. TT-P-0029 with standard brush, except Bon Ami instead of soap solution

Fed. Spec. TT-P-0029 with standard brush, except Bon Ami instead of soap solution

Tests	Freeze-Thaw Stability
Original—cps	2050
After 1st cycle	2230
After 2nd cycle	2170
After 3rd cycle	2100
After 4th cycle	2260
After 5th cycle	2450
Scrub to Failure	
48 hour dry	219
96 hour dry	1000+
Cleansability (strokes to remove)	
Crayon	35
Ink	10
Lipstick	54
Mercurochrome	100+
Pencil	59

Latex
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1980
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2360
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Fed. Spec. TT-P-0029 with standard brush

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Fed. Spec. TT-P-0029 with standard brush, except Bon Ami instead of soap solution					

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CARL P. LYNN, RICHMOND

RICHMOND'S MOST ENVIED EMPLOYEES: In jobs sweetened by company-sponsored coffee breaks, they stick tightly to . . .

Drugmaking Firm Believes in Fun

"One of the best fringe benefits is fun." With that hypothesis as a guiding principle in labor relations, and with a strong sense of family responsibility for the welfare of his employees, a drug manufacturer in Richmond, Va., has piloted his 77-year-old firm to within striking distance of the top 12 pharmaceutical houses in the country.

When E. Claiborne Robins took over direction of the A. H. Robins Co. in 1933, the company was relatively obscure and—like many companies in those days—was having depression trouble. Robins gives much of the credit for the company's success since then to his employees' "company spirit"; and has shown his appreciation through an employee relations program that includes:

- Occasional expense-paid holiday trips for the entire plant and office force, such as the recent trek to Florida and earlier junkets to New York City.

- Impromptu beach parties, picnics, and "open house" parties—many at the Robins' home—at the drop of a hint that his workers need a breather.

- Birthday cards with \$25 checks attached, to help all employees celebrate their personal milestones.

- Easter hams, Thanksgiving turkeys, Christmas parties and year-end bonuses for all employees.

Not Direct Incentive: Far from being a carrot-on-a-stick device for in-

veiging employees into driving themselves at a faster pace, these bounties are described by company officials as the outward signs of an unusually close—and mutually profitable—relationship between labor and management.

A tightly held family concern, the company was founded in 1878 by A. H. Robins, Richmond druggist and chemist, to market cascara in tablet form to practicing physicians. Listed as "Robins Compound," the medicine still is listed in the company catalog, largely for sentimental reasons. The founder of this ethical drug concern was succeeded as president by a son, Claiborne Robins, who died in 1912. The latter's widow managed the company until 1933.

The family doesn't disclose sales and profit figures, but recent surveys conducted by a national market research organization indicate that only 13 other drug houses in the country have higher prescription sales volumes than Robins.

\$250,000 Birthday Party: Successive expansion moves have carried the Robins company to the point where it has detail men in every state, agents in Canada and most Latin American nations, research projects in a number of medical schools and clinics, warehouses at Dallas and San Francisco, and a \$1.5 million plant, laboratory and office building in Richmond.

To celebrate the opening of the new building—and to mark the firm's 75th anniversary—the company in 1953 underwrote the entire cost of the first Western Hemisphere Conference of the World Medical Assn. and the Pan-American Medical Confederation at a week-long joint meeting of the two groups at Richmond. The company picked up a \$250,000 tab to pay all travel and conference expenses for delegates from 20 nations, for outstanding authorities in various medical specialty fields, and for 75-year-old general practitioners from all parts of the U.S.

Theme of the conference was "75 years of medical progress," a span of time that coincided neatly with the Robins company's diamond anniversary. Papers presented at the conference were published in book form by Robins and distributed to medical school libraries and physicians throughout the country—an action not bereft, of course, of promotion values.

No Stay-at-Homes: Most recent large-scale holiday for Robins' employees came earlier this winter when the president—a tall, brisk, quietly energetic man—shut down the plant and took all his employees with him on a four-day trip to Miami Beach. The company picked up all the bills and gave each employee \$100 for spending money, making the total outlay around \$25,000. The more than



ON NEW YORK JUNKET: Atop Empire State Building, Robins crew as sightseers.

100 vacationers traveled together in three chartered coaches on a going-South streamliner.

In 1949 and again in 1951, Robins took his crew "up North" for sightseeing trips to New York City.

As part of the normal plant routine, coffee and light refreshments are "on the house" throughout each working day, with 30-minute breaks each morning and afternoon.

Reciprocity Basis: The man responsible for the company's unorthodox approach to labor-management relations is convinced that the system pays off for all concerned on the simple basis of reciprocity: loyalty of a company to its workers' welfare generates company loyalty on the part of the

workers—and vice versa. As Robins puts it, "Fun is part of the job."

Robins' attitude toward his employees carries over into his community service activities. He contributed \$30,000 for establishment of a pharmacy in Richmond's World War II Memorial Hospital, paid for a new athletic field for the University of Richmond, and is a director of the Crippled Children's Hospital, one of Richmond's oldest charities.

His faith that well-treated employees "will repay you a thousand-fold" is supported by his company's growth and by the fact that his employees—who are not unionized—boast one of the lowest labor turnover marks in the industry.



WINTER TRIP TO FLORIDA: In the swim at Miami Beach, with boss in the fore.

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It's going to be pretty much up to businessmen themselves whether the Republican antitrust enforcement policy—in the long run—looks very much different from that of the Democrats.

The Republicans are showing no signs of filing fewer cases, but they have stressed getting as many cases as possible—old or new—settled out of court through consent decrees. On new cases, they have been trying to avoid delay and long-drawn-out court trials by getting companies to agree ahead of time to changes that the antitrust lawyers want. These are written into a consent settlement which is then filed with the court at the same time as the formal suit.

When the judge signs the decree, it puts the company under the same compulsion to live up to the decree as though it had been tried and found to have violated the Sherman act.

The biggest case settled under the new technique is the one against Eastman Kodak on its color film position and practices. Here's a blow-by-blow account of the 10 months of behind-the-scenes maneuvering that went on between Eastman and the Antitrust lawyers.

Trials Out, Parleys Preferred

Late last month (*CW, Jan. 1, p. 13*), the government filed a civil suit charging Eastman Kodak with monopoly of the color film processing industry and with signing illegal fair trade contracts. Simultaneously, a consent decree was entered that settled the issues in the case and set up sweeping changes in the industry.

This complicated case was worked out without a trial. In all, about 104 hours of face-to-face conference between Eastman and government representatives went into the case, most of it on details. One Antitrust official estimates that after the first nine hours of conference, the major points of the settlement had been agreed to.

Here's how it all began:

March

The Justice Dept. received a complaint from a small business, the Aljan Camera Co. in New York City, that Eastman was suing for unfair competition and violation of the state fair trade law. Aljan was selling at prices below the fair trade prices set by Eastman. Aljan complained that it should be illegal for a competing retailer (Eastman controls about 35 retail stores of its own) to set the price his competition could charge.

Under a procedure commonly used to help out on such small business complaints, a Justice Department lawyer in Washington called Rochester, N.Y., to talk with Eastman's counsel. At that time, a federal district court in

New York had pending a fair trade case against McKesson & Robbins, Inc., involving a similar complaint.

It was suggested that under the circumstances—a decision might be forthcoming any day—Eastman might think it best not to press the Aljan suit until a ruling in the McKesson case had been made. With some reluctance, Eastman agreed.

April

The same retailer again complained to the department, saying that Eastman now was pressing its suit. The department again asked Eastman to postpone, since the expected ruling in the McKesson case had not come. An April 29 conference between Eastman representatives and the Justice Dept.'s New York Office, concerning the suit, was unsatisfactory. Eastman held firm to its position and went ahead with the suit.

May

May 5: Washington staffers had begun to think of Eastman as a possible antitrust violator. Worth Rowley, a special assistant to the Attorney General attached in a supervisory capacity in the Antitrust Division's trial section, and Allen Dobey, a top staff trial lawyer and an expert on fair trade, requested permission from Antitrust chief Stanley Barnes to begin a preliminary investigation—the step that normally follows receipt of a complaint from an outside source.

On the same day, special antitrust lawyers just hired by Eastman (the Washington firm of Donovan, Leisure, Newton & Irvine) conferred with Rowley and Dobey, in an effort to recover ground lost by Eastman at the April 29 meeting in New York.

May 7: Eastman announced to its dealers that it was abandoning fair trade pricing on certain products—including some color film items—until two pending cases were settled: one, its own against Aljan; the other, Federal Trade Commission's charge that Eastman fair-trading was illegal.

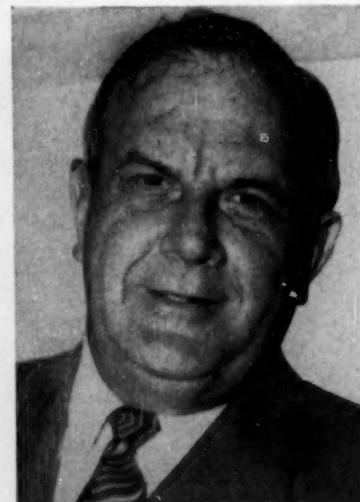
May 11: Eastman counsel again conferred with Justice Dept. lawyers to report this move. But the department lawyers said they had already set up an appointment with Barnes to consider a preliminary investigation of Eastman.

May 17: Rowley and Dobey met in Barnes' office to fill him in on what they knew about Eastman's practice of tying processing of film to the sale of film, its fair trading practices, and why—from their experience—a closer check might be worth while. It was agreed at this conference to start a preliminary investigation.

May 28: Another meeting was held in Rowley's office in Washington, with Judge Barnes and several of Eastman's officials and lawyers present, to go over the entire situation. Nothing definite was suggested by either side.

June

June 3: The New York trial court

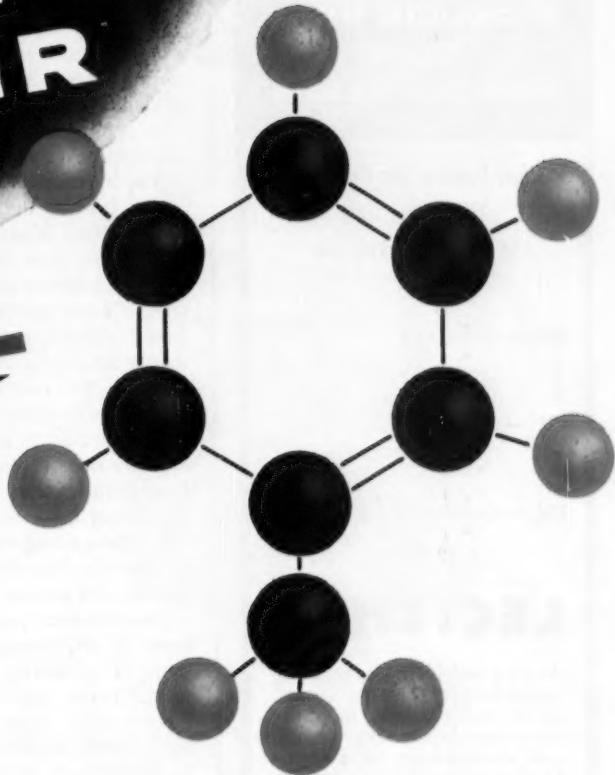


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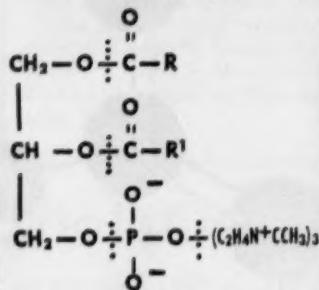
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BUSINESS & INDUSTRY

ruled in favor of Eastman against Aljian, upholding Eastman's fair trade contracts. The decision is now on appeal.

June 17: By this time, the field reports were in, and a formal complaint was in the works. Another meeting was held in Rowley's office, and Eastman was informed — unofficially — that a monopoly case was ready to be filed.

The antitrusters asked Eastman to confer later to discuss the facts and law relied on. Eastman was also asked for the first time officially whether it cared to schedule negotiations looking toward a settlement. Its answer: yes.

June 27: Rowley and Dobey completed their work on the complaint.

June 28: The next day, the first conference to consider a pre-filing settlement was held in Barnes' office. This was the decisive conference. Present from Eastman were six representatives (including some really top officials — one of them a long-time personal friend of Barnes'); from the department, five lawyers and Barnes.

The relative positions: Eastman came in still hoping to get the case dropped by offering a promise to "reform." Barnes told them the department couldn't drop matters so informally, and from here on Eastman knew it would have to accept a consent judgment—or go to trial.

July

July 12: Barnes took the complaint up to Attorney-General Herbert Brownell for final approval.

July 13: By the next day, Brownell had signed the complaint, and it was ready to file in court.

July 14: Eastman was advised by letter that the government was ready to file its complaint immediately, unless Eastman was ready to do some serious negotiation on a consent judgment. A 'phone conversation between Eastman lawyers and trial staffers in Washington let Eastman know the department wasn't interested in just any decree — it would have to be very complete.

July 16: Eastman's lawyers asked the department for a copy of the complaint and requested negotiations on a consent settlement of the case.

July 20: A copy of the complaint was mailed to Eastman. It was exactly like the complaint that later was filed in court. Several 'phone conversations between Washington and Rochester set up conferences in Washington on

settlement negotiations. Around this time, too, actual staff jurisdiction over the case was transferred to the Antitrust Division's judgment section, headed by William Kilgore. But the trial staff continued in active participation on the case.

July 27: Eastman counsel and officials conferred in Washington on settlement terms. They did not offer anything, however, concerning divestiture of any of its processing facilities. This had been decided on by the Antitrust Division as an absolute requirement of any settlement. Eastman was advised that its offer was unacceptable.

July 30: Rowley and Eastman counsel, in a 'phone conversation, put their cards on the table. Eastman agreed to work out something on divestiture and the Dept. of Justice agreed to hold off filing the suit until Aug. 3.

August

Aug. 3: Eastman submitted a counter to the government's "immediate" divestment proposal: wait seven years to give competition a chance to grow before decreeing any divestment.

Aug. 4: Substantial agreement was reached on the main terms of the settlement: divestment, separating cost of processing from sales price of film, ending fair trade contracts on color film, etc.

Aug. 5: A big round-table conference was held in Kilgore's office in Washington. Barnes was not present, but his staff received instructions from him by phone; one call during the conference lasted a half hour.

Aug. 17: Barnes, back in Washington, held a two-hour conference with Rowley and William P. Rogers (Dobey's trial assistant). Object was to work out details of the settlement, with special emphasis on how the divestiture section should read.

September

Sept. 1: About this time, the written statement on tentative agreement was completed. Then began the long process of hammering out the fine details to fill in the skeleton model.

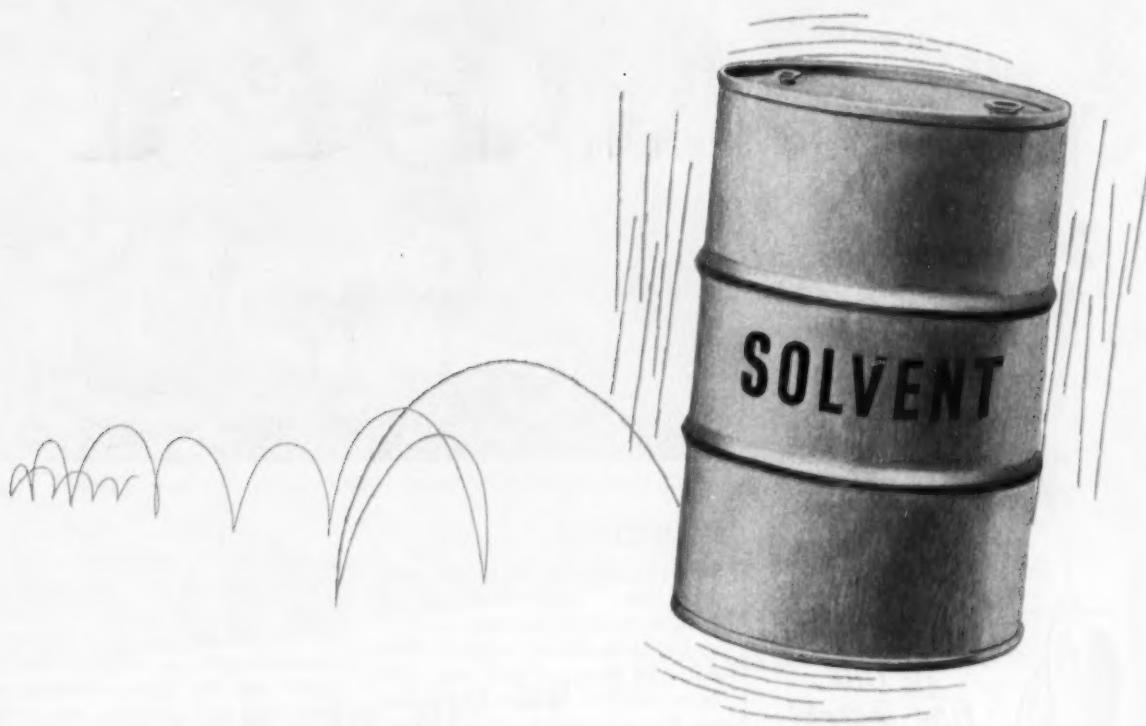
December

Dec. 21: The complaint and final judgment were formally filed in court and signed by Judge Knight.

March 1955

March 21: The decree becomes effective.

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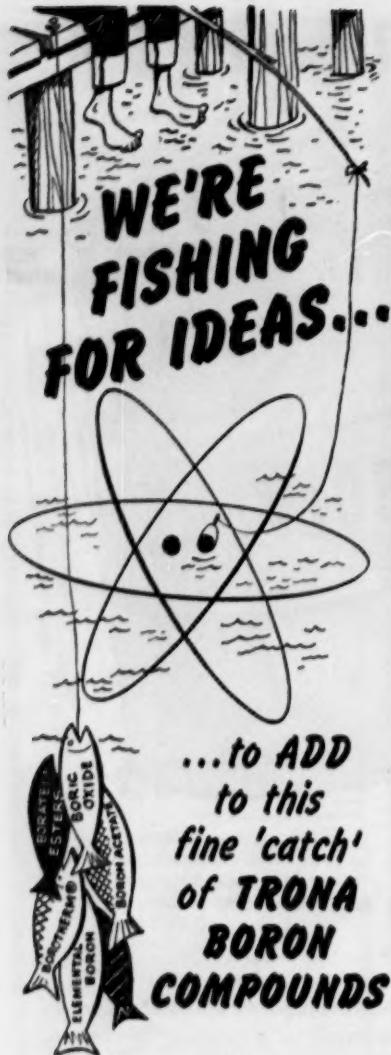


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BUSINESS & INDUSTRY



SHELL SAINT-GOBAIN: Detergents at Petit-Couronne at a rate of 25,000 tons/year.

FOREIGN

Expansion/France: The French chemical industry continued its post-war boom in 1954 by marking up record production in virtually all fields. Overall output advanced 16% over 1953; prices held firm. Sulfuric acid production, for example, exceeded 1.35 million metric tons last year (as compared to 1.18 million metric tons in 1953); output of nitrogen fertilizers increased 25% (with prices to farmers down 1.5%).

Foreign trade in chemicals advanced too. Imports in 1954 were valued at \$130 million (against \$105 million the previous year); exports rose from \$196 million to \$230 million.

While company profits for 1954 aren't out yet, it appears that French companies fared well too. Activity on the Paris Bourse in recent months has been unusually spirited; market value of the shares of 81 chemical companies listed on the Paris stock exchange rose from \$483 million at the end of 1953 to \$946 million on December 31, 1954. Apparent reason: a number of companies (such as Société Shell Saint-Gobain, *see cut above*) have recently brought new facilities on-stream, and have attracted much public attention.

Outlook for 1955: even greater production, higher profits, increased exports to both French territories and other overseas customers.

Phosphates/Jordan: As a result of phosphate orders flooding in from Iron Curtain satellite countries, the Jordan

Phosphate Co. in Amman will increase its plant capacity to 200 million tons/year. Within the past several weeks, Poland has filed orders for 25,000 tons of various types of phosphates, Czechoslovakia has ordered another 15,000 tons. Far Eastern markets are opening up too; Jordanian phosphates are finding new markets in Japan.

World Bidding/Belgium: A Belgian industrial syndicate has been formed under the name Sybeltra to invite foreign bids for delivery and installation of complete chemical plants in Belgium. Firms included in the syndicate: Ateliers de Constructions Electriques de Charleroi, Compagnie Belge de Chemins de Fer, Mercantile Marine Engineering and Graving Docks, John Cockerill, Ateliers Metallurgiques de Nivelles Electrorail, and the Societe Auxiliare d'Enterprises d'Electrification et de Travaux.

Paint/Venezuela: Fabrica Nacional de Pinturas (Pinco) will build a paint plant in the Boletita section of eastern Caracas. Capacity: 15 million liters/year of paints, cleaning fluids, insecticides, etc. Estimated date of completion: mid-1955.

Fertilizer/Austria: Austrian production of nitrogenous fertilizers in 1954 is estimated to have reached 542,000 tons—some 10% above 1953 records. Trade circles are also reporting that fertilizer manufacturers will do even better this year—have sold their entire output well into the fall of the year.

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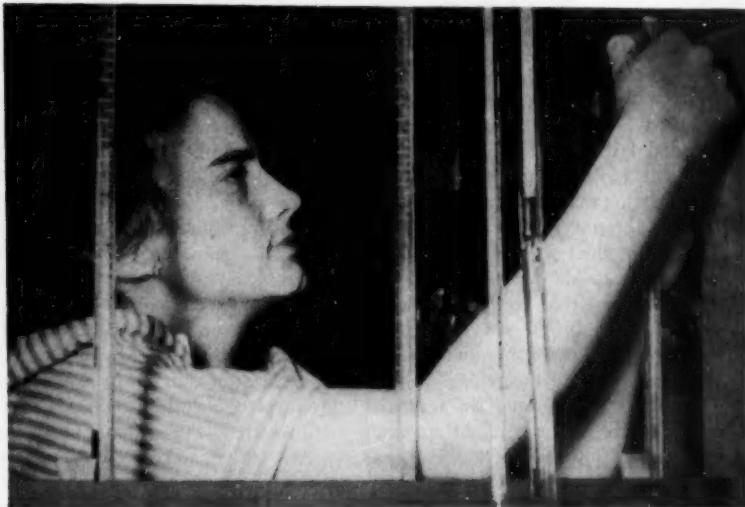


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WOMEN CHEMICAL WORKERS: Throughout industry, they ask increasingly . . .

Strong Role for Weak Sex

They're turning away from housework and moving into industry, and it appears that they're here to stay. At least, these working women have been showing greater job-holding power in the chemical industry than have the men-folks.

These are among the high points in latest data*—out this month—on the feminine corps in the country's labor force. The figures show that the chemical industry has been putting more and more reliance on women employees in recent years (*see table, below*) and now has more women on its payrolls than ever before, except for during the man-shortage days of World War II.

As to staying power in chemical employment, here's the current tally: during the readjustment from limited-war to a limited-peace economy, chemical companies trimmed their total working force from an average of 805,500 in 1953 to about 784,800 in 1954. But this cutback wasn't applied equally to the two genders. While the number of male employees declined by 2.66%, the quota of women employees dipped by only 2.18%.

Fifth of Force: Thus, year by year, women have been entrenching themselves in the chemical industry to the point where they now make up nearly one-fifth of the total personnel force. While women have come to be domi-

nant in clerical work and have gained strength in the factories, they still rank low in managerial posts and in the sales field.

The trend toward greatly increased use of automatic controls in manufacturing seems to have had the effect of curbing the percentage of women in scientific and technical work; for while there's a gradual increase in the number of women in jobs of this nature, there has been a considerably more rapid increase in the number of men in this field.

Average Age Rises: Though the chemical industry's aggregate voice

has been growing slightly more soprano through the past eight years, it still has a decidedly more masculine ring than those of at least 11 other industries. For example, 77% of all employees in the apparel industry and 58% of those in the tobacco industry are women. Apparently the most feminine segment of the chemical process industries right now is ordnance producing, in which 24% of the paychecks go to women.

Along with the increase in number of women in industry, there's a decided trend toward increasing maturity in women workers:

Age Group	1940 %	1954 %
14 to 19 years	11	9
20 to 24	20	12
25 to 34	28	22
35 to 44	19	24
45 to 64	20	30
65 and older	2	3

In 1900, the median age of women in the labor force was only 26; by 1940 it was up to 32, and in 1954 it reached 38 years. Paralleling this development has been the rise in the proportion of women employees who are married. In 1940, only 30% of the women workers were married; now this group has grown to more than 50%.

For chemical companies' personnel departments, the data seem to point toward prospects of potentially profitable utilization of the increasing number of more mature women who want to work—provided that ways can be found to reduce the relatively high job-turnover rate for women.

More Numerous, More Mature, Fully as Feminine

Women in U. S. Industry

FROM 1950 TO 1954

Number of women employed in chemical industries rose from 115,000 to 143,200—an increase of 24.4% while number employed in all industries rose from 18.1 million to 19.7 million—an increase of 8.8%

Percentage of women among chemical employees rose from 16.9% to 18.3% while percentage of women among all employees rose from 29% to 31%

Proportion of all women employees aged 35 years or older rose from 54% to 57%

FROM 1948 TO 1952

Median wage-and-salary income for women rose from \$1189 to \$1398—an increase of 17.6% while median for men rose from \$2445 to \$3201—an increase of 30.8%

* "1954 Handbook on Women Workers," compiled by the Women's Bureau of the U. S. Dept. of Labor.

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BUSINESS & INDUSTRY

Still Under Scrutiny

Manganese experts of the government's stock piling agency—General Services Administration—recommended last week against the establishment of any full-scale plant for beneficiating manganese ore or for upgrading the government's stockpile of submetallurgical ore at this time. Reason: after considered study, they're not convinced that work on flotation processes has progressed far enough to insure economic operation of any plant regardless of the type chosen.

However, the agency (in a special report of the status of eight research projects on different methods of getting manganese from the ore) is optimistic about chances of building a plant some 18 or 20 months hence. By mid-1956, it predicts, the results of current investigations will have been completed; the government will

be in a much more favorable position to determine which process offers the greatest merits.

Manganese is a key alloying metal for which the U.S. must now rely on overseas supplies, but its importance to industry isn't confined to steel companies alone. Ever since World War II, the government has been seeking to discover some way of economically extracting manganese from U.S. raw materials for industrial consumers—since most major U.S. sources (in Aroostook County, Maine and the Cuyuna Iron Range in Minnesota) produce the metal by the open-hearth slag method at too low a percentage to be usable today, except at prohibitive costs.

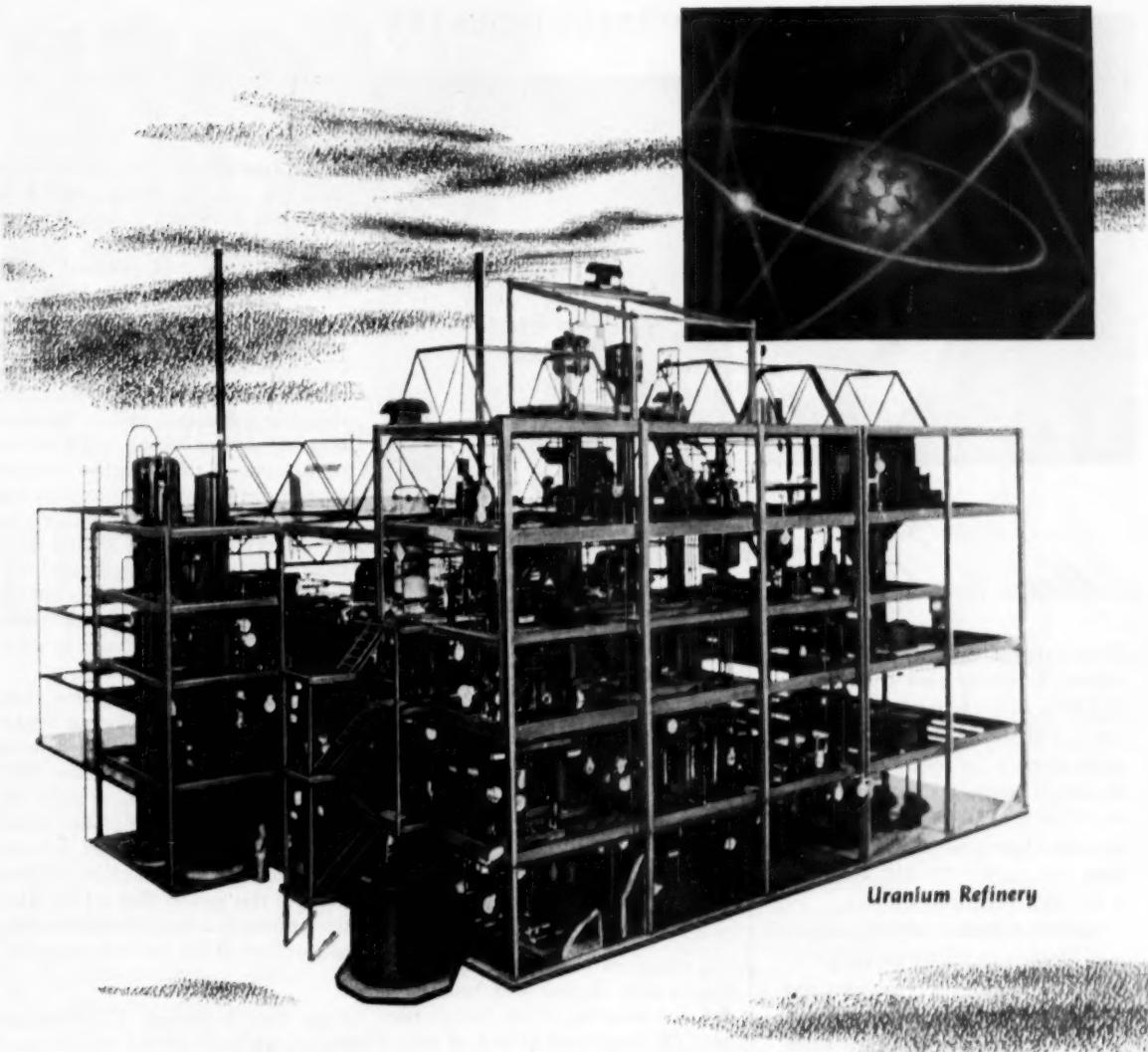
No substitute method has yet been offered (and tested) to GSA's satisfaction, however, though some pyrometallurgical experiments are "encouraging."



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WIDE WORLD

REP. BARDEN: On T-H changes, his committee will have major voice.

L A B O R

At Legislative Controls: Those latest proposals for new federal legislation in the labor-management relations field now will go before Congressional committees headed by Sen. Lister Hill (D., Ala.) and Rep. Graham Barden (D., N.C.). Both committees will have much to say about President Eisenhower's recommendations in his State of the Union address—boosting the federal minimum wage from the present 75¢/hour to a new 90¢/hour level, and two revisions in the Taft-Hartley law: (1) employers as well as unions to be required to file non-Communist affidavits in order to be eligible for services of the National Labor Relations Board; and (2) strikers to be permitted to vote in representation elections. In addition, the Senate committee will have to pass on Presidential nominations to fill vacancies in the NLRB and its staff.

Income Insurance: Members of the United Gas, Coke & Chemical Workers (CIO) this week are deciding whether to take out group insurance policies to provide supplementary income in case of disability due to sickness or injury. Union officials explain that benefits would be in addition to any received under workmen's compensation, state disability payments, or other hospitalization or disability insurance. Example of benefits: \$100/month for a maximum of 12 months; \$200/month for three months of that period if the

insured member is confined in a hospital.

Labor Law Points: Two recent court decisions look as though they'll be landmarks in various aspects of labor-management relations:

- At Washington, Federal Judge Charles McLaughlin has ruled that a company has the right to discharge an employee who refuses to answer a Congressional committee's questions about Communistic activities. McLaughlin ruled that such a dismissal was for "obvious cause," and therefore no violation of the collective bargaining contract between the company and the union. This case was brought by the allegedly left-wing United Electrical Workers, formerly affiliated with the CIO, against General Electric Co. over GE's policy of firing workers who invoke the Fifth Amendment in refusing to testify about communism.

- Louisiana's state supreme court has affirmed an antipicketing injunction that had been issued by a lower court in connection with the 1953 strike against certain sugar mills and refineries. Basis for the higher court's opinion: ". . . the sugar cane industry . . . is so vital to the welfare of those living in this section that any threat to the industry is a threat to the economy and welfare of the entire community."

Lime Vote Protested: Vice-President Asbury Howard of the International Union of Mine, Mill & Smelter Workers (Ind.) has asked for an investigation of a former federal official accused of bias against the union in a representation election at the Mississippi Lime Co.'s plant at Ste. Genevieve, Mo. Howard is asking both the National Labor Relations Board and the Senate Labor Committee to make the investigation.

According to Howard, Mine-Mill's victory in an election at that plant last July was voided by V. Lee McMahon, then NLRB regional director at St. Louis. Then, Howard charges, McMahon took part in an "intensive campaign" that helped the Glass, Ceramic & Silica Sand Workers (CIO) win the rescheduled election last month; and two weeks later, Howard asserts, McMahon resigned from the NLRB to take "an important position" with the lime company. A statement of denial was understood to be forthcoming.

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WIDE WORLD
REP. IKARD: On federal regulation of gas sales, he leads legislative assault.

L E G A L

Natural Gas Warfare: Texans like Rep. Frank Ikard are starting to wage a four-month battle in Washington to nullify last year's U.S. Supreme Court ruling in the Phillips natural gas case. Theme of their campaign: independent producers of natural gas have enough to contend with—such as costs and uncertainties in prospecting—without being subjected to regulation by the Federal Power Commission. Ikard spent part of last week opening the legislative assault on federal control. He related the natural gas industry's side of the struggle, and drew support from other members of the Texas delegation.

Foam Suit Simmers: It's Nopco's move next in the isocyanate foam plastic patent lawsuit now simmering in federal district court at Newark, N.J. (CW, Dec. 18, p. 40). Du Pont—which brought the infringement action in an attempt to clarify the multicompany muddle over who owns which process and product rights—last week filed a reply to the defendant's answer, and this week is scheduled to take depositions from Nopco President Edwin Robinson and four other Nopco officials. In its latest filing in this case, Du Pont admits that it owns five patents relating to foam plastics, and avers that all were legally issued; admits that tolylene diisocyanate is unpatented and unpatentable and that

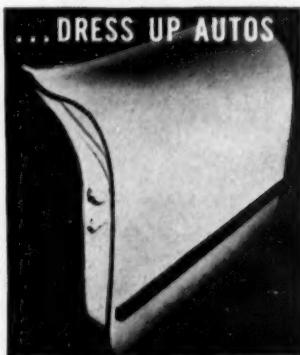


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Du Pont manufactures that compound and methylene-bis(4-phenylisocyanate) on a commercial basis, but denies that this production is on a "large scale" as stated by Nopco.

Sweetener, Dry Cleaner: Two recent decisions by appellate courts in Pennsylvania apply to chemical companies:

- Pennsylvania's state supreme court has upheld a lower court's ruling that the state department of agriculture had no right to stop the sale of soft drinks sweetened with Abbott Laboratories' "Sucaryl." The court declared that the old state law prohibiting the use of such sweeteners is contrary to the state and federal laws (see p. 78).

- At Philadelphia, the U.S. Circuit Court of Appeals has increased the amount of damages awarded last April to the Laurence C. Smith Co. of Syracuse, N.Y., in its breach of contract action against Onyx Oil & Chemical Co. The district court at Wilmington, Del., had awarded Smith \$25,000; the appeals court ruled that Smith should also have an additional \$3759 for certain expenses incurred in connection with a contract on marketing of dry-cleaning supplies.

KEY CHANGES . . .

Bernard Peyton, to director, Du Pont Co., Wilmington.

W. Alton Jones, to board chairman; **L. F. McCollum**, to president; **A. P. Frame** and **Harold G. Osborn**, to vice-presidents; Petroleum Chemicals, Inc., New York City.

Joseph B. Talbird, to comptroller, Rayonier Inc., New York City.

Donald B. Tuson, to comptroller, Reichhold Chemicals, Inc., New York City.

Frank M. Cashin, to vice-president, Kaiser Aluminum & Chemical Corp., Oakland, Calif.

William L. Walsh, to manager of manufacturing, Dyestuff and Chemical Div., General Aniline & Film Corp., New York City.

Oliver A. Gottschalk, to assistant to the president, The Carborundum Co., Niagara Falls, N.Y.

Kurt C. Frisch, to assistant research manager, E. F. Houghton & Co., Philadelphia.

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CARDIS* 314	184-189	4-6	4-5	13-16	45-55	EMULSIFIABLE PETROLEUM WAX
CARDIS* 319	180-185	5-7	4-6	18-20	65-70	EMULSIFIABLE PETROLEUM WAX
CARDIS* 320	180-185	5-7	4-5	28-30	75-80	EMULSIFIABLE PETROLEUM WAX
CARDIS* 262	195-200	3-5	BROWN	14-17	40-45	SPECIALLY PROCESSED PETROLEUM WAX
FORTEX	190-200	3-5	2½-3½	0.0	0.0	MICRO-CRYSTALLINE HARD AND PLASTIC
MEKON* B-20 A-20 Y-20	190-195 190-195 190-195	3-5 3-5 3-5	BROWN-BLACK AMBER-6 MAX. YELLOW-3-3½	0.0	0.0	MICRO-CRYSTALLINE HARD AND BRITTLE
POLYMEKON*	200-MIN.	0-3	YELLOW	0.0	0.0	SPECIALLY PROCESSED PETROLEUM WAX
WARCO WAX 180	180-185 180-185	4-7 4-7	WHITE BROWN	0.0	0.0	MICRO-CRYSTALLINE HARD AND BRITTLE
WARCO WAX 150-A	145-155 145-155	15-20 15-20	YELLOW 1-2 BROWN	0.0	0.0	MICRO-CRYSTALLINE PLASTIC
WARCOSINE	150-155	15-20	WHITE	0.0	0.0	MICRO-CRYSTALLINE PLASTIC
PARAFFIN	136-138 ASTM	FULLY REFINED				CRYSTALLINE
CANE WAX 700	169-174	1.0-1.5	BROWN	25-30	70-90	VEGETABLE WAX
CANE WAX 500	171-176	3 MAX.	LIGHT BROWN	25-35	55-70	VEGETABLE WAX
CANE WAX 517	165-170	1 MAX.	BROWN	20-30	65-75	VEGETABLE WAX

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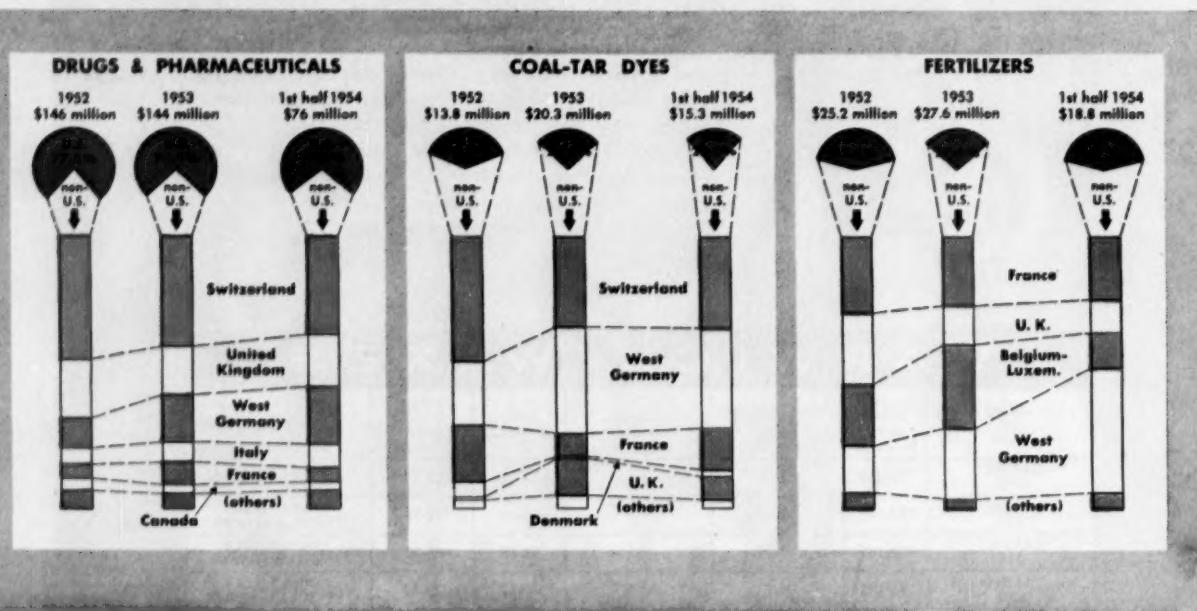
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Latin Melon: How Big is Europe's Bite?

Chemical exports up—stiffening resistance to European competition—braking of the sales skid. That's the cheering picture for U.S. chemical sales to Latin America for the first half of 1954 as revealed by just-released United Nations Commodity Trade Statistics.*

After experiencing a \$25-million (7.6%) drop in sales in 1953 (relative to 1952), U.S. chemical exporters rang up \$167 million for the first six months of 1954. This could point to about \$335 million for the year, up 10% over 1953, 1.8% over 1952. Viewed from a percentage-of-market basis, the news is almost as encouraging: the U.S. sliced off 62.3% for the first half of 1954, as compared to 62.5% for 1953, 66.7% for 1952.

Although it may be possible to infer from this improved showing that U.S. shippers are learning to live with the problems of a competitive Latin mar-

ket, the problems are by no means diminished. Just ask any exporter.

Exporters will usually start reciting their list of trading difficulties with the Latin dollar shortage and better credit offerings of European competitors, add the problems of lower prices, lower freight costs, and plain more-aggressive selling.

But in spite of all this, the U.S. is still the number one chemical supplier south of the border, with more than 50% of the market in all but fertilizers and coal-tar dyes. Of the nine chemical Standard International Trade Classifications that are important on the Latin American scene, six showed slowing decreases in the U.S. market percentage, four enjoyed an increased volume, and two held even. Commodity by commodity, here is how the U.S. and Western European nations are dividing the Latin chemical melon:

Drugs and Pharmaceuticals: Pharmaceuticals constitute the largest single chemical import of Latin American countries. These nations bought \$143.5 million worth in 1953, off \$2.5 million from the preceding year. For 1954, however, it appears that imported drugs may top \$150 million.

The U.S. should maintain its 1953

receipts of about \$106 million, although its portion has dropped again—this time to 71.3%. This decrease is slightly less than the '52-'53 decline of 77.8% to 74.4%.

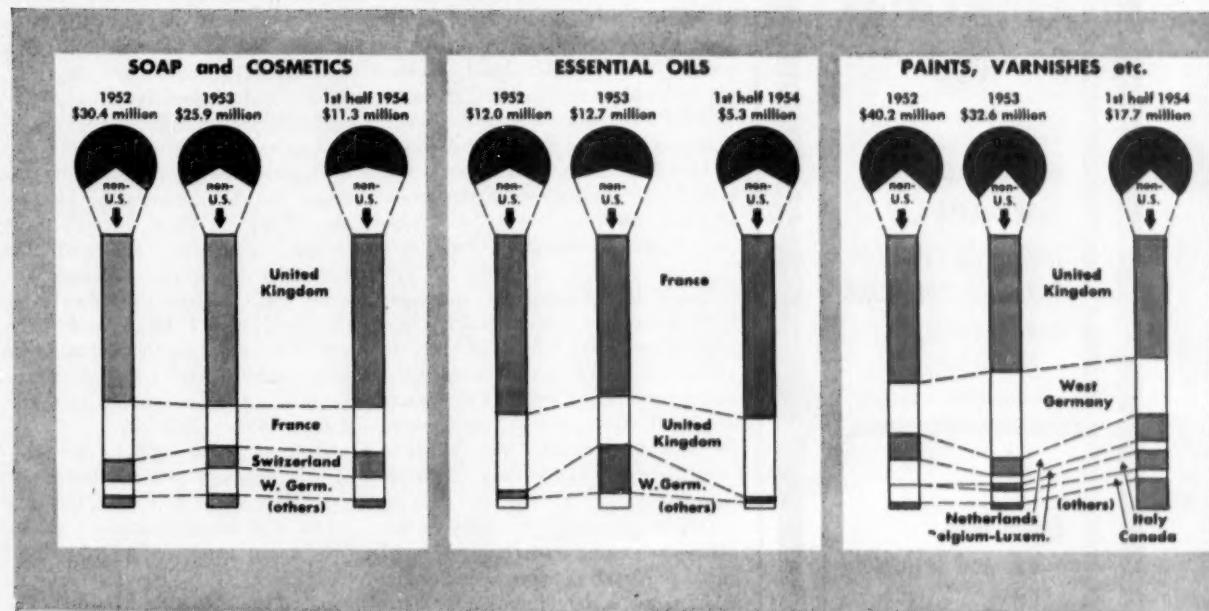
Switzerland, the second largest factor, is capturing a fairly constant 10% of the whole. W. Germany, Italy and the U.K. have registered small but significant gains. (10.8% to 14%). Germany, too, has displaced the U.K. from No. 3 spot, had some 6.2% of the market as against the U.K.'s 5.5%.

According to one well-positioned U.S. supplier, the data reflect German resurgence towards the important position it held prior to the war. While anticipating that 1955 will bring further European advances, it observes that "American companies are waking up and fighting back. . . . European gains will level off."

Coal-tar Dyes: Of all fields, coal-tar dyes are the least promising for U.S. companies. The first six months of 1954 again brought a drop in the market share although dollarwise, exports appeared to be well ahead of the previous two years. Some solace may be had from the tapering off in rate of decrease: 11% between '52-'53 but only 3.9% between '53-'54.

* United Nations' figures are compiled from official reports of reporting nations. As such the figures do not include non-reporting countries: Spain, Japan, USSR, or Soviet satellites. The exports of these countries, however, are believed to be insignificant now.

Switzerland, also a non-reporting nation, has been included in CW's analysis because of its importance in several categories. Swiss exports were obtained from the official Swiss trade figures, classified by CW according to the Standard International Trade Classification and added to the appropriate UN groups.



W. Germany and Switzerland appear to be leveling off (at 29% and 26% respectively). The big gainer, however, is France—up to 12% after a 6.4% finish in 1953.

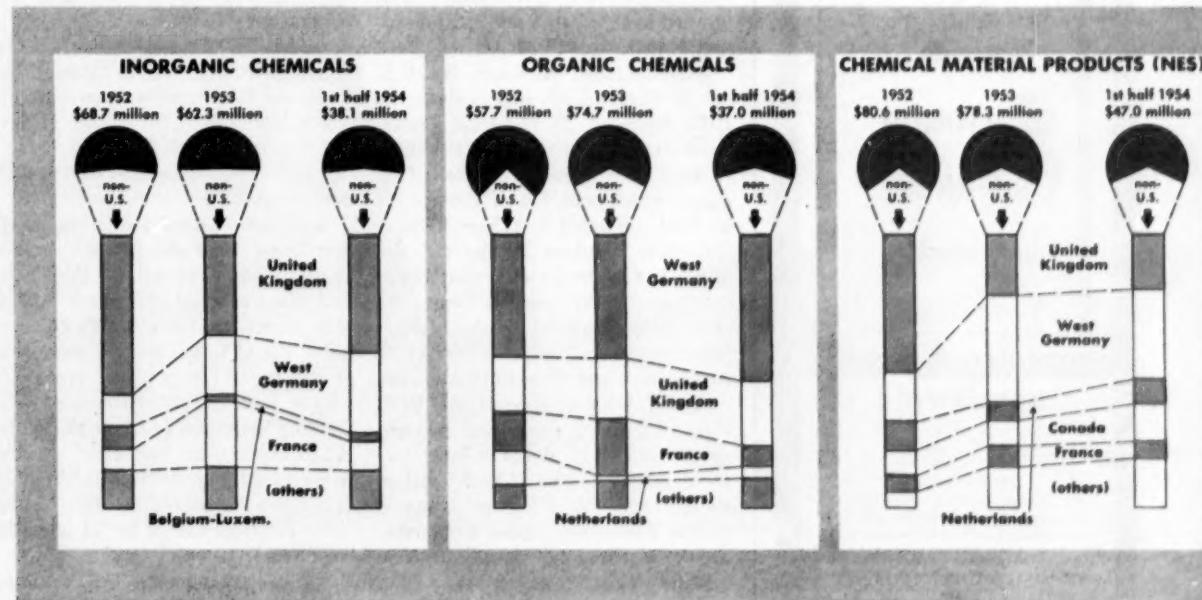
Explanation for rising sales in the face of dropping percentage: pricing. Latin America is buying higher-quality, higher-priced dyestuffs. Low

European prices and the ever-present dollar shortage are important factors, particularly in Argentina and Brazil, which are not issuing import licenses for U.S. dyestuffs.

Fertilizers: The U.S. seems to have had a bumper year in this class, with exports possibly over \$16 million. First half '54 sales beat all '53's.

Of the European countries, Germany alone recorded an increase (18.9 to 26.5%). The U.K., France, Italy, and particularly Bel-Lux (22.5% to 7.3%) have fallen drastically.

Two explanations for this are offered. On one hand, a major U.S. producer-exporter believes that the U.S. is merely holding its own, that



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the European drop (especially that of Belgium) was caused by a shift of efforts to other areas (Far East for Belgium) where a higher price prevailed. On the other hand, another exporter opines that the Belgium spurt of 1953 resulted from Soviet satellites' dumping large quantities into Antwerp at very low prices. This material was mixed with Western European goods, sold in Latin America. By 1954, however, East Germany and Poland were "sold out."

Soaps and Cosmetics: Decreases both in the total imports and U.S. exports appear most significant here. In 1952, the Latin market took \$30.4 million compared with '54's estimate of \$22-23 million; over the same period the U.S. has dropped from \$21.6 to (extrapolated) \$13 million—57.1% of the market.

One large soap and toiletry maker believed the drop a result of increased local production, more competitive U.S. pricing, a tighter market for some specialties. A relatively high purchase price in Brazil for luxury items (such as toiletries) also contributes to the downward trend.

Of interest is the steady recovery of the United Kingdom. It has taken 26.1% of LA's soaps and cosmetics. U.K.'s share in 1953: 20.4%. The same producer attributes this to a sterling loosening, better quality, and lower prices. Germany seems to have leveled off at 3.6% and Switzerland, something of a surprise, steadily moved upward last year to a modest, but appreciable 3.7% of the market.

Essential Oils: Although the U.S. cut of essential oils returned to the 1952 figure of 73.5%, total (extrapolated) sales are less (\$7.6 million vs 1953's 8.9 million). Western Germany, which took 5% of the market in 1953, shriveled to a bare 0.6% in '54. U.S. suppliers ascribe the rise in the U.S. share to somewhat better dollar availability, consider Germany's 1953 showing a freak, probably a result of trade deals with France which gave some oils a German provenance.

Paints: After an encouraging 1953, U.S. sales nosed downward percentagewise although dollar volume was about constant. The U.K. leveled at about 11%; W. Germany dropped (5.1 vs 7.0%); the smaller continental countries swung up sharply (9.0 vs 3.2%).

Lower prices—not the dollar short-

age—one exporter believes is the reason for the U.S. decline. He adds, "The long-term outlook appears extremely poor because of mounting local production. Mexico, Brazil, Argentina, Chile, and Colombia already have well-established industries."

Another bar: protective tariffs.

Organic Chemicals: The downward trend for U.S. continues, although slowed in pace. Final '54 totals should record about \$42 million in U.S. coffers; a 58.6% slice. Western Germany and U.K. have carved out larger chunks (21.5 vs 15.2% and 9.6 vs 7.6%) but France appeared to be lagging behind (3.0 vs 7.1%). Smaller European nations were up also: from 4.4% in '53 to 7% in '54.

Reviewing the figures, one major organic producer pins the decrease on the dollar shortage, better European credit, and more elaborate European selling and servicing. Additionally, it forecasts another drop for 1955 but expects the fall-off to be less than '53-'54.

Chemical Materials and Products (NES): This is a catch-all grouping which includes plastics, insecticides, caseins, adhesives, and just about anything not readily classified elsewhere. The entire group appeared headed for a bonanza '54, with indicated value of \$94 million. While the U.S. slipped both sales- and marketwise between '52-'53, the downward trend seemed arrested at about 63%. U.S. '54 sales (\$60 million) should be some \$10 million over 1953.

Generally, the market showed few fluctuations from 1953, although the U.K. and W. Germany were evidently off a bit (7.3 vs 8.1% and 12.1 vs 14.3% respectively) while Canada and the Netherlands increased (5.0 vs 3.2% and 3.1 vs 2.2%).

Inorganic Chemicals: Here, as in fertilizers, 1954 should have proved a prosperous year for the U.S. Sales are running ahead, indicate a total of \$45 million for the year. Percentagewise, the U.S. was snaring more than it had in the two previous years.

The U.K. and West Germany were holding their own (17.2 vs 17.8% and 11.6 vs 10.6%) but Italy suffered reverses (1.0 vs 3.0%). Only France has fallen far behind; its 1954 selling pace less than half of its '53 rate (4.2 vs 11.6%).

One explanation for U.S. upsurge: some inorganics went into short sup-

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ply in Europe. (One exporter tells CW that he's shipping to Western Europe—almost unheard of before).

What's ahead for Latin American trade? Most exporters believe that within the next few years European advances will halt and the U.S. will obtain a lessened—but stabilized—share of the chemical trade. But this will take work, plenty of hard selling, service, and competitive pricing.

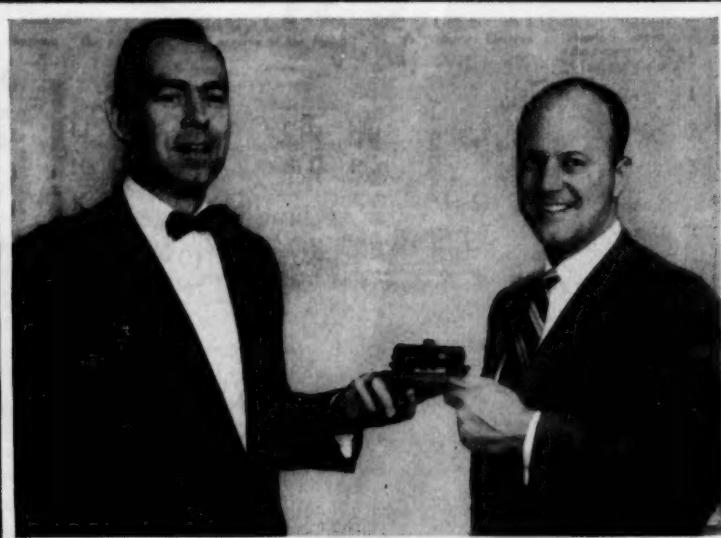
Nitrate Rules

The Coast Guard has finally made effective permanent regulations on packaging and handling of ammonium nitrate compounds—including fertilizer—which have to be shipped through a port.

The new permanent regulations issued last month are either the same as, or relaxations from the interim regulations, which were issued piecemeal beginning in 1952. No more restrictions are added.

At the time of the Texas City explosion in 1947, caused by spontaneous combustion of wax-coated ammonium nitrate, no specific rules applied to shipping and docking of the various forms of nitrate fertilizers. After Texas City, the Coast Guard refused handling of the material at ports, except with the specific approval of the Coast Guard district officer. With complete responsibility on them, officers rarely approved shipments, except in one or two isolated port areas such as Braithwaith, La. (near New Orleans).

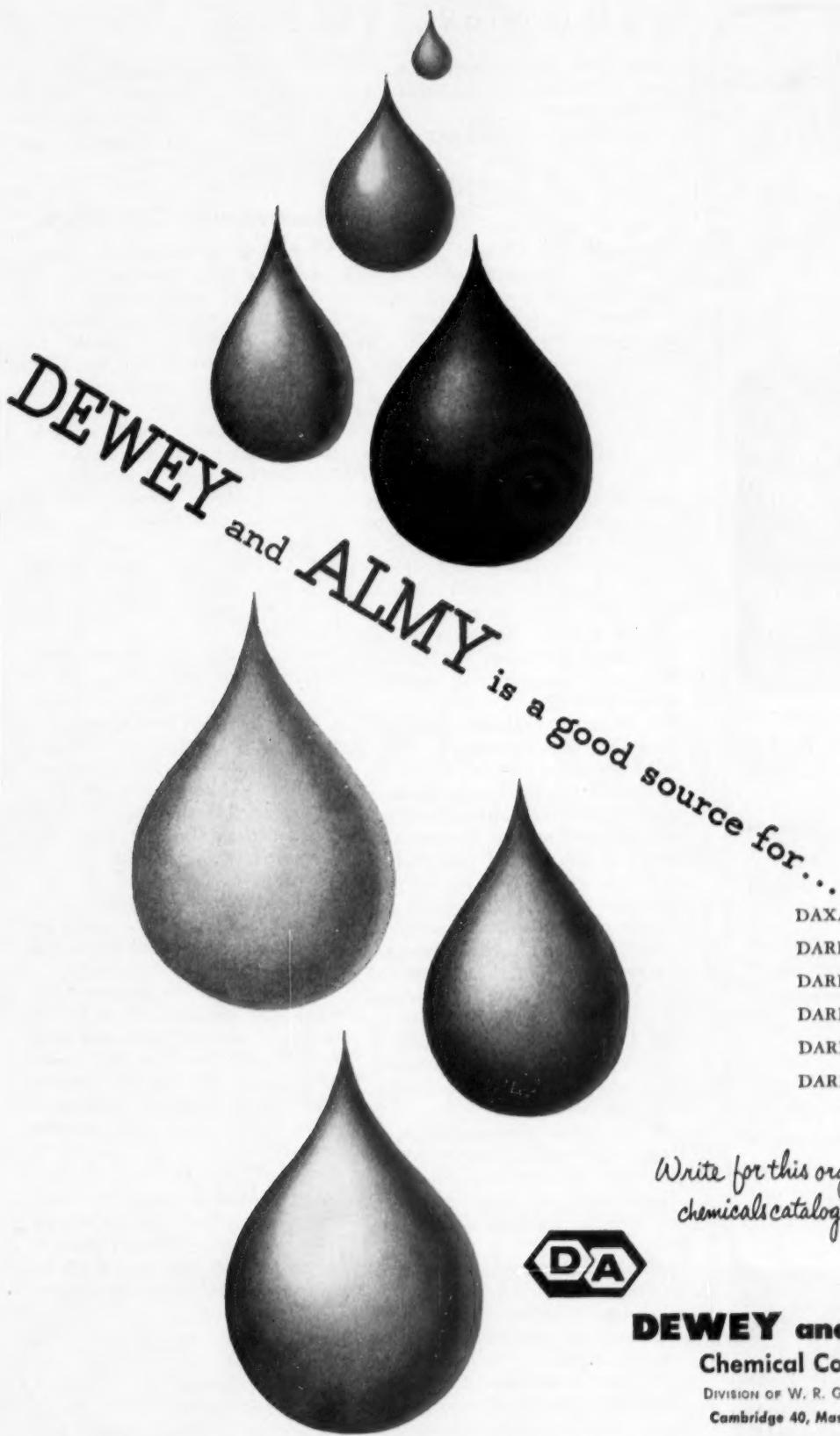
In May '47, a government interagency committee on the hazards in transportation of ammonium nitrate was appointed by the Secretary of the Treasury. The National Academy of Science was assigned the job of determining the hazardous characteristics of the various ammonium nitrate compounds—ammonium nitrate-phosphate, ammonium nitrate-carbonate, ammonium nitrate sulfate, mixed fer-



Model for a Salesman

FOR SELLING the first tank car of one of Carbide and Carbon Chemicals' "Tergitol" surface-active agents, Gould Bernard, Atlanta District Mgr. (right), receives the first scale-model tank car (suitably inscribed) from L. D. "Les" Berger, Fine Chems. Asst. Product Mgr.

The award, in this form stemming from Berger's model building interests, supersedes a former certificate award for tank-car "firsts." On the same occasion, W. A. Woodcock, Fine Chems. Div. Mgr., presented a similar model to D. M. Nielsen, Newark field salesman.



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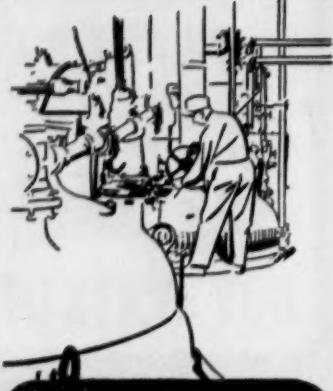
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Methyl Glucoside is a new crystalline, cyclic polyol; available in 100-lb., multi-wall paper bags. Samples and technical literature are available on request.

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tizer (over 13% ammonium nitrate) and both coated and uncoated ammonium nitrate.

Based upon reports of several private groups to which the Academy sublet its work, the results were submitted to and approved by the Secretary of the Treasury on April 7, 1954. The Coast Guard then proceeded to draw up detailed regulations for handling ammonium nitrate products. These were incorporated into regulations released, after considerable deliberations among interested parties, on Dec. 14, 1954.

Generally, the rules are divided as follows:

- Wax-coated ammonium nitrate in paper bags must have a permit from the Coast Guard district commander before it can be handled at docks, and then it must be loaded at an extremely isolated area. If the coated compound is packed in a metal container it needs no permit. However, since Texas City, this compound is no longer being used for fertilizer, being shipped in only small quantities as an explosive.

- Uncoated ammonium nitrate and ammonium nitrate-phosphate (prills, flakes, grains and crystals), shipped in combustible containers, must also have a permit from the district officer, but once obtained may be handled in a port area less isolated than that of coated ammonium nitrate, but still with free access to open water and fire-fighting equipment. If packed in metal containers, it needs no permit.

- Ammonium nitrate-carbonate and mixed fertilizers (over 13% ammonium nitrate by weight) may be unloaded at any port facility, provided port security regulations are followed. No permit is needed for handling in paper bags.

- Ammonium nitrate-sulfate is no longer considered a dangerous oxidizing agent. All other compounds are so considered, and must be stowed aboard with maximum fire precautions.

- In shipments of less than 1000 lbs. no permit is needed on any type of ammonium nitrate.

If compounds are packed in ICC-approved metal containers—which is rarely done in commercial practice—ammonium nitrate compounds, other than wax-coated, may be shipped without regard to most of the above regulations.

If a new formulation of ammonium nitrate is to be shipped, a 1000-lb. sample must be sent to the Coast Guard for approval at least 60 days in advance of shipment.

Recovery at Carthage

When Stanolind Oil and Gas' Brownsville, Tex., plant goes onstream this fall, its entire annual output of 125 million lbs. of water-soluble chemicals will be marketed by 75-year-old distributor, R. W. Greeff & Co., Inc. That's the substance of a recently signed contract between the two.

The chemicals to be handled by Greeff originate as by-products of Stanolind's Carthage Hydrocol hydrocarbon synthesis process plant at Brownsville. A breakdown (by classes) of the output works out like this:

- Alcohols—55%. These include methanol, ethanol, n-propanol, iso-propanol, n-butanol, iso-butanol, pentanol.
- Acids—22%. These consist chiefly of acetic and propionic acid.
- Ketones—16%. Included are acetone, methyl ethyl ketone, methyl n-propyl ketone, methyl n-butyl ketone.
- Aldehydes—7%. Principally acetaldehyde and propionaldehyde.

For Stanolind, the chemical recovery operation will mark the end of a four-year delay. Although the Brownsville plant was completed in 1951, process and mechanical hurdles in Carthage Hydrocol, which supplies the raw materials, postponed opening of recovery operations.

For Greeff, the new agreement will entail some expansion of its present nucleus of petrochemical sales staff. According to President Ira Vandewater, the company will draw upon its experience acquired in handling a similar line of chemicals for another producer.

Export Marketing Course: The City College (New York City) is offering an evening-session advanced course in "Applied Export Marketing of Chemicals and Drugs." Registration dates: Feb. 2-4.

Sales Center:

- Abbott Laboratories' new New England sales and distribution center is located at Needham, Mass. Facilities include 20,500 sq. ft. of warehouse space plus offices.

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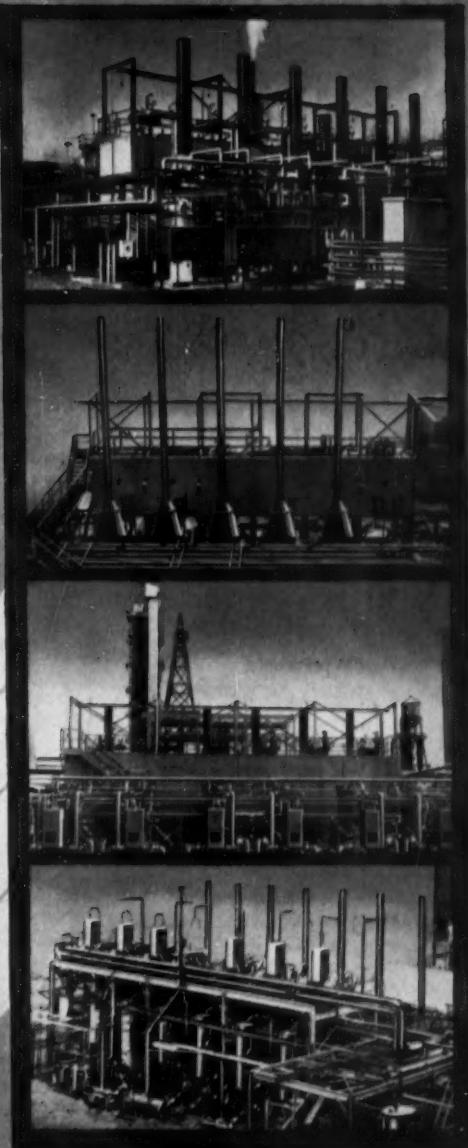
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New products and profits with Armour Chemicals



Chemicals crack economy barrier— float up minerals selectively!

Discoveries in the mining field have proved again that necessity is often the mother of invention. With the depletion of high grade ore, methods of recovering minerals from low grade ore had to be found. It was discovered that chemical substances could be made to preferentially coat one type of mineral in a mixture of several types. The coated particles in turn attach themselves to air bubbles introduced into the system and thereby become buoyant. Since some minerals, once coated, float more readily than others, they could be floated up in order and selective flotation came of age.

The Armour Chemical Division participated in these flotation discoveries by producing the first cationic non-metallic flotation reagents. As an example of their economy, only two ounces of an Armac®—an Armour fatty amine acetate—are sufficient to separate and float the concentrated mineral from one ton of ore!

The Armacs also have the ability to change many types of surfaces from water-accepting to water-repelling in both oil and water solutions and suspensions. Other unique properties make the Armacs profitable as anti-statics and as emulsifiers for oils, waxes and resins. Send the coupon for our new Armac booklet containing more information on flotation and other applications.





Neo-Fat® 10 keeps shower curtains colorful!

Nobody wants to pay for a nice new plastic shower curtain that will change color when it's exposed to heat or light. But manufacturers of vinyl chloride polymers have this problem due to the presence of unsaturated fatty acids in their vinyl stabilizers.

To combat this discoloration, the Armour Chemical Division tested Neo-Fat 10, a high purity coconut oil fatty acid having a capric content of 92%. The results show that metallic soaps made from Neo-Fat

have the desired compatibility with vinyl films and do not contribute to cloudiness, bloom or yellowing in the finished products. The reason for this is the absence of unsaturated acids.

The high acid value, low moisture and low unsaponifiable content of Neo-Fat 10 insure a maximum of metallic soap per pound of fatty acid. Send for the booklet and free samples of Neo-Fat 10—another example of new profits with Armour Chemicals!

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The inert chemical nature of Stearone, a symmetrical high molecular weight aliphatic ketone derived from stearic acid, and its resistance to degradation by high temperature suggest a number of profitable applications.

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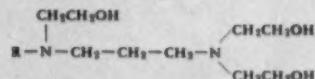
Send for Stearone samples and Bulletin G-1 which gives more information on Stearone and other profitable Armour fatty ketones.

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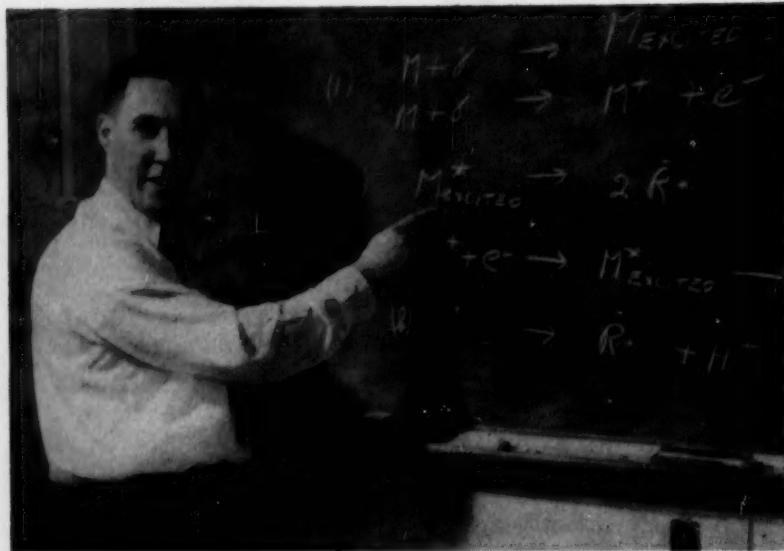
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RESEARCH . . .



BROOKHAVEN'S BALLANTINE: His blackboard ciphers spell industrial opportunity in radiation-catalyzed reactions. For polymer researchers, he avers, it's . . .

'The Next Frontier'

Largely neglected in the initial rush of activity over isotope tracers and atomic power, radiation catalysis is now generating an epidemic of excitement throughout the chemical industry. Last week, for example, Diamond Alkali Co. caught the fever, joined the swelling ranks of companies that are en-

deavoring to find work for gamma radiation in chemical synthesis. Like Standard Oil Development Co., another radiation enthusiast, Diamond is constructing new facilities to carry out its research plans.

Pioneers in the true sense of the word, these firms are entering virgin

commercial territory. To shed light on the magnitude of their chosen task, CW went to the nuclear engineering department of AEC's Brookhaven National Laboratory (Upton, N.Y.), buttonholed youthful David Ballantine—the man who pilots Brookhaven's fission products utilization project.

It's on the subject of polymerization that Ballantine is most enthusiastic. "Aside from radiation," he explains, "there's just no other way to bring about this type of reaction without using heat, pressure, or chemical catalysts. But gamma rays offer advantages over all of these. They don't introduce foreign matter to the mix—a consideration, for example, where electrical properties of the end product must be controlled. And they can't be poisoned like conventional catalysts."

Lending substance to these theoretical attributes is a growing body of encouraging data obtained in Brookhaven experiments. A radiation-formed polyvinylpyrrolidone, that may be better for blood-extender purposes than the commercially made polymer, was reputedly developed by Ballantine. Gamma rays, used as the catalyst, give precise control of molecular weight, a necessity in avoiding adverse physiological effects. Synthesis specifications (which Ballantine figures could be commercial): 1-2% monomer in water, 15 minutes exposure to 200,000 Roentgens of radiation/hr.

In conjunction with staffers of the Polytechnic Institute of Brooklyn, Ballantine and co-workers studied polymerization of acrylamide in the solid state. High molecular weight and rapid reaction rates were obtained well below the melting point (85°C) of the white crystalline material. To confound skeptics, who attributed the polymerization to localized heat (not discernible externally) from the gamma rays, the experiment was repeated with high-melting (200-300°C) potassium acrylate—with the same result.

In other investigations, previously unsynthesized polymers such as polyperfluoropropylene, polyperfluorobutadiene, polyperfluoroacrylonitrile, and a cross-linked polymer of 1,1-dihydroperfluorobutyl acrylate were formed by exposure of the monomers to the catalytic rays.

Gamma irradiation also prompts esoteric chemical behavior that is still



"You can't put a price tag on processes as new as these . . ."

to be fathomed by polymer researchers.

Some monomers gamma-rayed at low temperatures (-18°C) don't polymerize, but when they're raised to room temperature they explode. Reason: it's believed that radicals, formed at the low temperature, are immobile until the substance is warmed. Discounting this violent behavior, Ballantine sees the chemical principle involved as a potentially useful tool in polymerization.

"It's often the case," he explains, "that a polymer consists of a mixture of hypothesized addition isomers—e.g., 1,2- and 1,4-butadiene—and the ratio of the isomers is a function of polymerization temperature. Initiation of

the reaction at low temperatures by means of radiation might give better control over the composition of the end product."

Conjecturing further, he says: "There is also the chance that heat-sensitive monomers can now be polymerized since normal polymerization techniques usually require temperatures that cause the reactants to decompose."

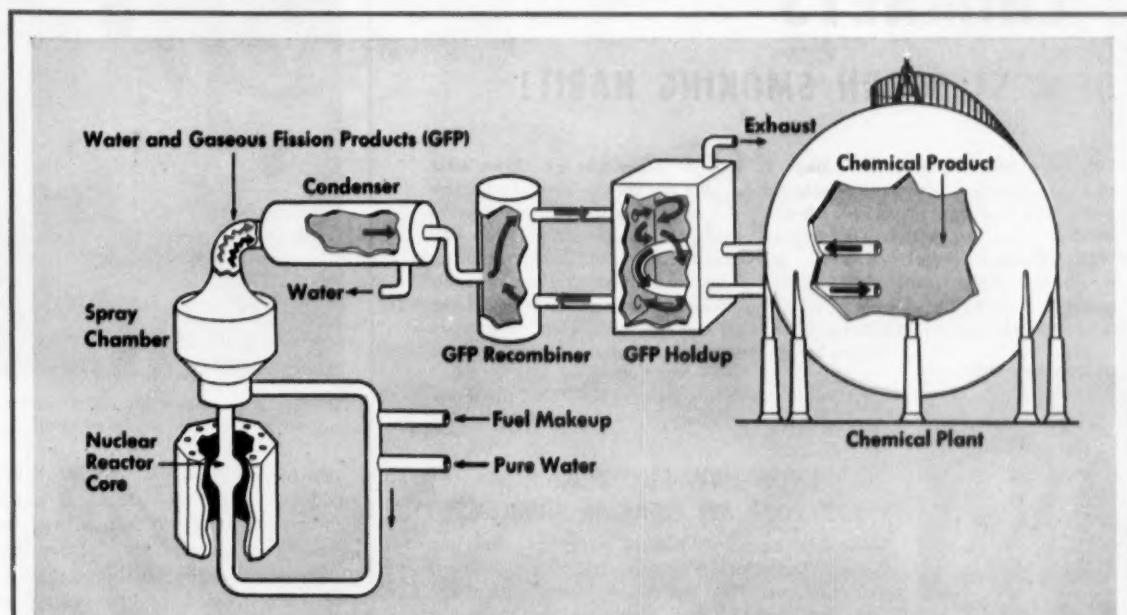
Another idiosyncrasy of gamma irradiation hinges on the unpredictability of its effects: while polyethylene and a number of polymers become cross-linked on irradiation, others—e.g., methylmethacrylate—degrade. Ballantine points out that this is one reason

radiation polymers are bound to be at least slightly unlike their conventionally made prototypes. These differences may, in his opinion, extend the range of profitable uses for plastics.

Well aware of critics who question the commercial justification for radiation catalysis, except perhaps in the instance of irradiated polyethylene* (CW, Apr. 3, '54, p. 69), Ballantine has this to say: "You just can't put a price tag on processes as new as these are. We need more information."

"Admittedly, it's hard to visualize

* Which is made by a simple, noncaptive irradiation of finished polyethylene; radiation does not have to be engineered into the process.



Preview of Commercial Chemical Irradiation

NO ONE IS READY to take a gamma-ray-sparked synthesis into a production plant, but it's never too early to contemplate that future day. The fanciful flow-chart shown above is the result of some nimble mental gymnastics on the part of Brookhaven's Bernard Manowitz, who heads the program in which Ballantine's work is concentrated. Combining low fuel requirements (about 1200 grams of uranium-235, as uranium nitrate) with inherent safety

of operation, the arrangement is one approach to putting radiation chemistry on economically sound footing. The projected process works like this. Uranyl nitrate solution feeds in at the fuel make-up inlet, circulates around reactor core where chain reaction of the U-235 takes place. Now highly radioactive, the fuel solution travels to a spray chamber which flashes off water, liberating entrained gaseous fission products (mainly xenon and krypton). These,

in turn, are driven into a holdup chamber where they come into contact with a chemical product line. The "hot" gases irradiate the circulating chemical, are partly spent. They then pass back into the recombiner that adds enough fresh gas to bring radioactivity up to the desired level. Waste fission products of operating reactors are another source of gamma rays for chemical irradiation. Built into a mobile unit, they could be brought right into plants.

RESEARCH

any economical substitute for heat in polymerizing styrene, for example, unless the irradiated product has improved physical properties. What is needed is more people in industry evaluating such properties, a chore for which we have neither the staff nor the facilities."

In this connection, Ballantine reveals that Brookhaven is trying to develop a joint project with the Bureau of Standards for evaluation of materials irradiated at the laboratory.

He makes it plain that there's no valid reason for any industrial indiffer-



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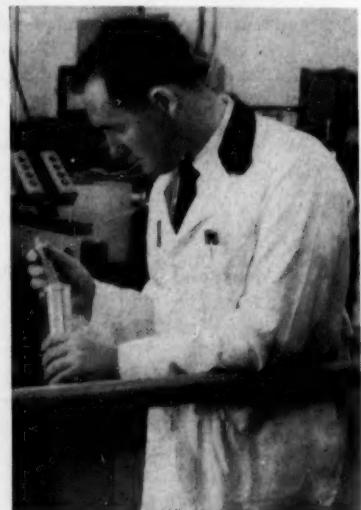
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"It's going to take a lot more research . . . to justify a major investment."

ence to this problem. "We're always glad to irradiate materials sent to us. The charge for this is nominal and we return the samples for the sender's evaluation. There's no shipping problem; the treated samples carry no residual radioactivity."

It's no secret that a lot of chemical firms have already availed themselves of this service, including such polymer-minded organizations as B. F. Goodrich, Monsanto, Dow, and Minnesota Mining and Manufacturing. Oil companies, too, like Standard Oil Development, have leaned heavily on Brookhaven's facilities.

That the relationship has paid off is evident in the justification felt by some of these pioneers in building their own radiation labs for intensified and expanded research. Some of these will use cobalt 60 as their gamma-ray source (e.g. Diamond Alkali). Others, like Dow and Humble Oil Co., rely on

U. S. Industrial Chemicals Co.
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This new strategically-located plant in Tuscola, Illinois produces 50,000 tons per year of anhydrous ammonia. Part of it is converted into nitric acid which is transformed into ammonium nitrate by reaction with more ammonia. In turn the ammonium nitrate is used in the manufacture of nitrogen solutions composed of nitrate and ammonia in water.

The new unit is adjacent to the USI sulfuric acid installation which came onstream in September, 1953. Thus two of the most important chemicals for agriculture are available from this plant site.

The USI ammonia plant
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Included in the products to be available from this plant are both commercial and refrigeration grades of anhydrous ammonia and all formulations of ammonium nitrate — ammonia solutions. Special formulations can be tailored to the user's requirements.

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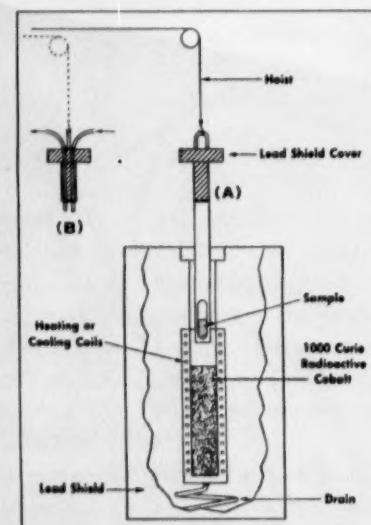
Van de Graaff generators (to supply high speed electrons) for irradiation work. Accelerators rate high on safety, available dose rate, availability, and well-established technology of operation, take a back seat to cobalt-60 in ease of maintenance, penetration and target-area which can be irradiated.

Both Ballantine and Brookhaven's Bernard Manowitz (an associate of newly formed Radiation Applications, Inc., New York consulting firm) have given a great deal of attention to possible ways in which radiation may be used in future commercial applications. They're agreed that the most likely form such equipment will take is depicted by a scheme (*see illustration, p. 49*) using a rapidly circulating liquid fuel from which gaseous fission products are separated immediately after the reactor core and transferred to an irradiation chamber.

A feature of this plan is that only a small amount of uranium-235 is necessary to make the reactor critical. They figure the initial fuel investment at \$42,000 (based on 1200 grams of U-235 at \$35/gm.). But the over-all investment in reactor plus irradiator could be as much as \$1 million—amortized over a period of 5 years.

Right now, it isn't easy to pick a gamma-induced reaction that would justify this kind of investment. But there's a good chance that one will be found. Production of polyethylene, solid state polymerization, and such other chain-reacting unit processes as halogenation, amination, oxidation, nitration, sulfonation, etc., are all possibilities. Others are hydrazine via liquid ammonia, benzene from hexane, and caproic acid from cyclohexanone.

"Still, such attractive-sounding processes aren't just around the corner,"



Gamma Rays in the Lab

VARIOUS irradiation setups have been designed for laboratory investigations of gamma ray syntheses. All, however, embody the same fundamental features. The unit diagrammed here—built for Diamond Alkali's new Painesville, O., radiation research laboratory—is typical. The radioactive cobalt radiation source (in the form of a jacketed pipe) is contained at the bottom of a lead-shielded well.

Samples for irradiation are placed in a specially constructed holder and lowered into the radioactive pipe by means of a hoist. For continuous process irradiation studies, chemicals may be piped into the radioactive zone by means of inlet and outlet tubes built into the lead well cover. The apparatus also contains temperature controls in the form of coils that can be used either for heating or for cooling.

In the laboratory building, the entire unit would be installed in a shielded chamber and manipulated from the outside by means of remote-control devices. Standard Oil Development's new radiation laboratory caches its "hot" cobalt pipe at the bottom of a hole in the floor of a small concrete cell. Mechanical arms, operated from a position outside the cell's 4-ft.-thick walls, allow researchers to set up experiments within the range of intense radioactivity. A 3-ft.-thick lead-glass window is required for safe observation of the working area.

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RESEARCH

says Ballantine. "They need a lot more research before they'll justify a major investment. With industry's active interest, that time may not be too far distant."

Expansion Roundup: Industry's optimism for 1955 is mirrored in new outlays for research expansion:

- Union Oil Company (Los Angeles) plans \$1-million worth of new facilities at its \$8-million Brea, Calif., research center. The additions, scheduled for completion this fall, include 33,000 sq. ft. of working area for large-scale experiments, pilot plants and laboratories, a new steel building (27,000 sq. ft.) for experimental equipment, and two single-story office buildings.

- Nearing completion on 400 acres near Columbus, O., are the first units of Battelle Memorial Institute's new chemical engineering, metallurgy, and minerals processing facilities. The \$300,000 construction program provides for two major buildings (totaling 13,000 sq. ft.).

- At St. Louis, Mo., Monsanto's organic chemicals division has just started up a new paper chemicals laboratory, will use it primarily in application research on the firm's line of fortified rosin sizes.

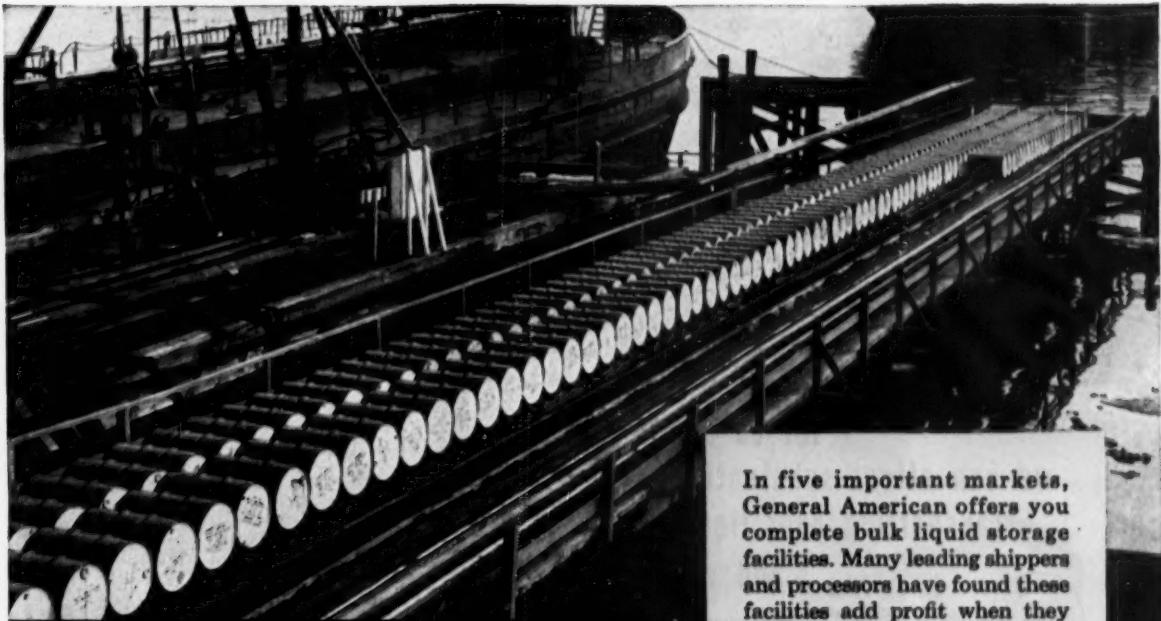
- And for supplying radioactive materials to the oil industry, Tracerlab has now established a lab in Houston, Tex. In launching the new facility, the firm says oil exploration, drilling, transportation, and refinery operations now constitute the largest industrial use of artificial isotopes.

Chemical Entries: This week's crop of new chemicals turned up the following:

- Dajac Laboratories' (Leominster, Mass.) 2,4,7-trinitrofluorenone is reportedly of interest in petroleum research and analysis, forms stable, brightly colored, sharp-melting complexes with polynuclear hydrocarbons and their derivatives. Dajac's data sheet on the new reagent lists more than 150 TNF complexes, 46 literature references.

- Micron-size sodium hydride crystals are available in an oil dispersion from Metal Hydrides, Inc. (Beverly, Mass.). Claimed features of the new product include high reactivity, relatively small fire hazard, and a new low price.

- Biotronic Laboratories (Coven-



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CW-15

RESEARCH

try, Conn.) now makes bis(cyclopentadienyl)-iron, and a range of new porphyrin chemicals.

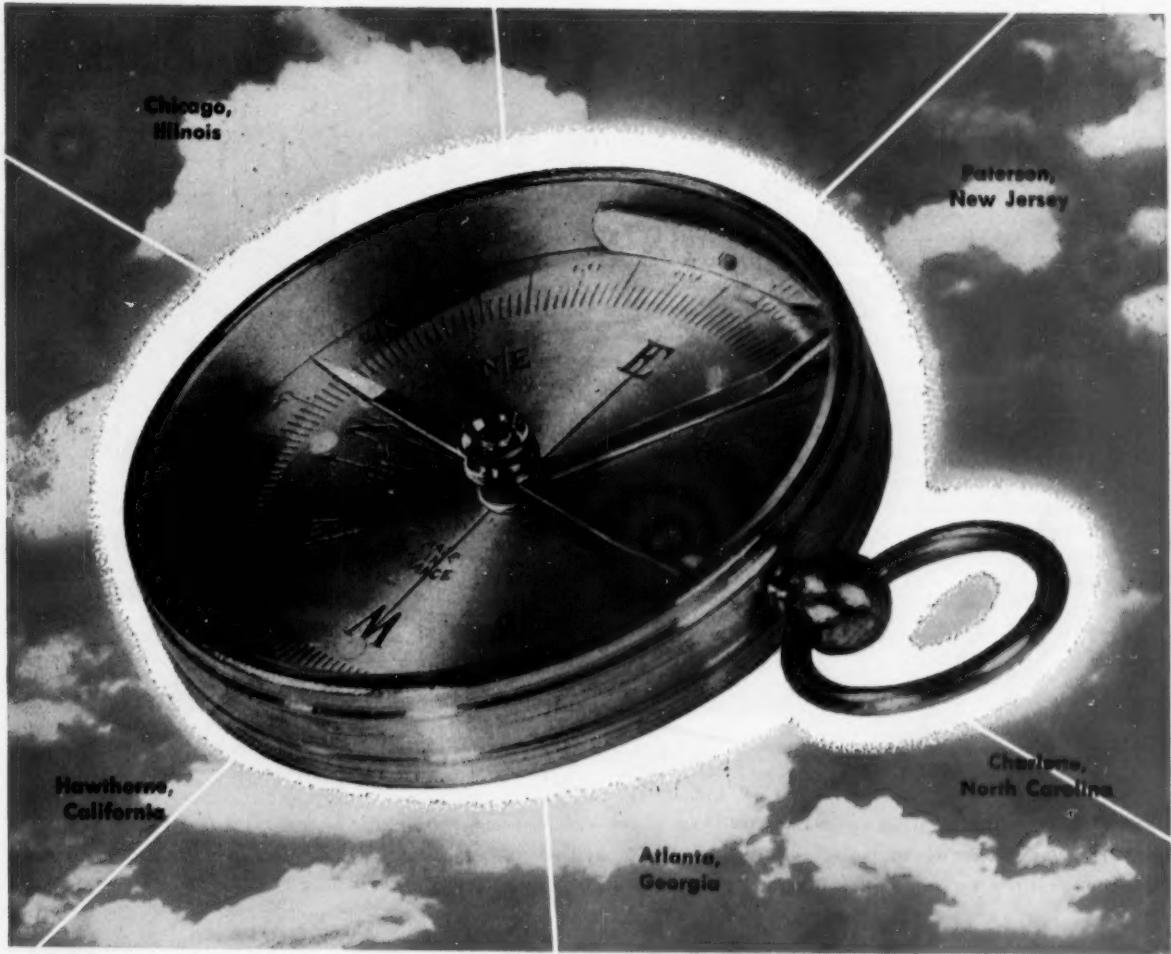
- Recently developed by Du Pont, a detergent-copolymer of lauryl methacrylate and diethylaminoethyl methacrylate is said to prevent the formation, at low temperature of sludge in motor oils.

It's being used in lube oil additives of the company's petroleum chemicals division.



New Leaf in Prospecting

RESEARCH now under way at the University of Arizona (Tucson) could make geiger counters surplus baggage in uranium prospecting. Financed by the Atomic Energy Commission, the project has revealed that trees and shrubs (whose roots go down 10 feet or more) are accurate guides to the presence and extent of uranium deposits. The roots of these plants pick up uranium minerals, transmit them to the leaves. At the University's greenhouse, botanists Roger Anderson (*left*) and Edwin Kurtz feed plants nutrient solutions containing uranium traces, note the effect on the plant's appearance. Their goal: to accurately correlate appearance with uranium content. Vegetation is claimed to be more accurate than counters in indicating the depth of a uranium lode.



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PRODUCTION

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DATE		HEATED BY	GAS TEMP. IN
PRODUCT		SIZE	GAS TEMP. OUT
CUSTOMER		SPEED	HEAT LOAD
BUST SYSTEM		% MO IN	% MO OUT
MAT'L DISCHARGE		BURNER	
MAT'L FEED		FURNACE	
DRIVE .7 HP		GEN'L DESCRIPTION:	
DUCT			
TRUNNION			
WT. ON TIRE			
SEALS			
LIFTERS			
FAN			
CFM			
IF A JOB—SEE OVER FOR TECHNICAL DATA			



Card-coder Pitt shows how engineering and cost data can be spelled out on punched cards. Here, for a new job, RFQ (the reference number, top) is first filled in and then punched out; other data—e. g., drive (bottom)—follow until all pertinent features are specified along holed-out edges.

Case Histories on Cards

Like a refreshing breeze came news last week that man-controlled operations haven't yet seen the ultimate in utilization, are still gamely vying with vacuum tubes and machine-controlled systems. Object in point: an old-fashioned punched card (*see cut*). Case in point: how Standard Steel

Corp.'s (Los Angeles) Norman Pitt has fashioned this research tool into a novel process instrument for coding engineering and cost data.

Still in a plastic state, the punched card system has yet to yield all of its advantages (or limitations), is currently being molded into a closer-fit-

ting form for the company, a manufacturer of industrial dryers. But this much, declares Standard, has already been realized: from a total investment of \$3000, the system is returning \$10,000/year in savings.

Of equal significance: Use of the cards cuts off almost three weeks' pro-



Looking for a specific item, Pitt punches out pertinent cards, repeats until only those cards having all specified data are left.



Speed Boats from COKE OVENS?

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Why not? It's common knowledge that speed boat hulls, automobile bodies, furniture, luggage, and household appliances are made nowadays from polyester resins. And one of the vital ingredients used in the manufacture of polyester resins is Styrene Monomer—a synthetic chemical derived from benzene, a product of the coke oven carbonization of coal.

In addition to its use in the basic resin, it is also used by the fabricator as

a solubilizer and thinner, since Koppers Styrene Monomer controls flow and penetration, and helps maintain the strength, flexibility, and rigidity of the polyester solution.

Of course, polyester resin is but one of the important contributions that Styrene Monomer makes to the chemical industry. Synthetic rubber, waterbase paints, polystyrene plastic and even dye-stuffs stem from this important chemical building block.

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PRODUCTION

essing time required on preliminary equipment bids—only 5-10% of which end up as orders. Too, claims Chief Process Engineer Pitt:

- It makes the experience of old hands readily, infallibly, and permanently available to newcomers.

- It enables the company to catalog complete dryers and their components (according to function or ability to do a particular job) on 8 x 10½-in. cards.

No Magnification Needed: Not as spectacular as writing on the head of a pin, it was almost as difficult concentrating all this process data within the space provided on punched cards. Unlike the literature field where researchers—especially chemists—are

and collective memory in hopes of uncovering pertinent information in old job orders. In actual operation, an inquiry is now handled like this:

A customer writes Standard, for example, requesting a quick cost estimate on equipment for drying a certain type of soil similar to sand, specifies that the dryer must be oil-fired and concurrent. Rough calculations plus experience indicate that a 7-ft. dryer is required.

Standard then punches through its cards on concurrent dryers, sorts out a 7-ft. job handling similar material at the specified rate, with the proper drive and dust collection system, but not having the specified heat requirement. Another punch through the cards uncovers a second dryer with the correct heat requirement and for which furnace price is listed. This price is added to the cost of the first dryer less furnace, and the estimate is then sent to the customer.

In addition to component costs, the cards can be used to determine dryer size and operating conditions whenever this information isn't handy.

For the Future: Conceived over two years ago, the system has been in actual operation just slightly more than a year. Spurred by high engineering and estimating costs on infirm, preliminary dryer bids, Pitt set about his task late in 1952, decided that a punched card system was the answer, then worked out a suitable format for the individual card. In 1953, the engineering department combed its files back to 1949 for dryer and component data. This then had to be organized, selectively broken down, and coded.

Today, Standard has 800 cards in operation, fattens its files continually with cards made up on "irrefutable hearsay" as well as on all new estimates it makes and on any pilot tests it runs. Eventually, the company hopes to include all rotary dryer installations (regardless of origin) in the country.

But the system, Pitt feels, is still punctuated by gaps that have to be closed. Beginning the first of this year, the company will change over to double-row cards, thereby making it possible to pull out the desired cards directly instead of having to go through a process of elimination. It is also working on a system for punching coding engineering drawings as well as data.

Despite such shortcomings, the sys-



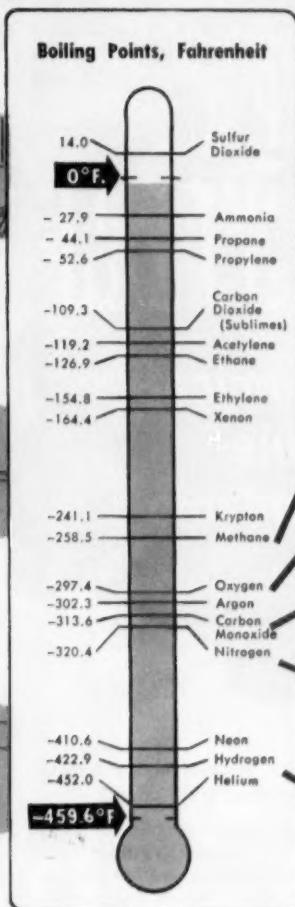
STANDARD'S PITTS: For the future, a double row of holes.

overwhelmed by abstracts and references that may be coded merely by subject, the process and equipment industries must work with a slew of specs and data.

At Standard, for example, dryers are always custom jobs, require singular combinations of various (sometimes standard) components. This meant that a punch card had to be designed so that each job could be broken down into material of construction, feed, fuel, furnace, burner, dust system, *et al.*—all detailed on the face, punched coded around the edge.

With such information neatly clipped out in code holes, Standard then—in answer to a request—could quickly run a rod through a mass of cards, come up with a number of cards containing the required specification instead of wasting time searching its files

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PRODUCTION . . .



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BEATRICE, NEBRASKA

tem obviously offers engineers and production men a way out from under the deluge of technical data. As a new application of an old tool it's significant; it's economical; and it can be tricky. Make-up of the cards is all important, warns Pitt, and a great deal of thought must be given to just what is wanted and how best to get it. But it can be done, and there is little argument that the returns are worth the effort.

Explosives in Solitary

The best place to be when working with explosives is as far away from them as possible, preferably with a few concrete walls in between. Such an arrangement, of course, is generally infeasible; but Italy's Montecatini recently demonstrated that a somewhat modified arrangement of long-distance control was practical as well as possible as it completed one explosives plant at Avigliano, Italy, started another at Orbetello.

Operations at both plants make use of automatic machinery and a complicated system of telecontrol composed of thermal, acoustical, visual, and power control units. At its most dangerous point—the kneading of nitroglycerine with clay to make dynamite—the operation is carried out in a unit isolated from workers.

All controls are located in a central station safely removed from the mixing machine. A television screen in the central station enables the operator to keep tab on the machines; the controls allow him to start or stop rotation of the mixing vat. As an added precaution, the motor that powers the mixing machine is set safely apart, works through long transmission shafts.

Cartridge Control: In an arrangement that resembles a Rube Goldberg invention, this system of long-distance control is also being introduced now into the new cartridge factories. But because of the comparatively smaller operational scale, the telecontrol system will use an optical relay instead of television to obtain more detailed images.

All machinery in the cartridge factories will be reflected in mirrors. Specialized workers looking through binocular periscopes will be able to see clearly what is taking place, to supervise the operation through a set of long-range control units.



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PRODUCTION

Aim: Anhydrite Acid

Preparing to step up the pace of her battle for sulfur independence, Britain last fortnight added substantial reinforcements to her industrial arsenal. The armament: two huge, cannon-like rotary kilns installed at the abuilding \$14-million Widnes plant of United Sulphuric Acid Corp. Ltd. The target: 148,000 tons/year of sulfuric acid from anhydrite (anhydrous calcium sulfate).

Ever since the critical sulfur shortage in 1951, Britain has sought efficient methods to by-pass brimstone, exploit her rich natural anhydrite resources. Imperial Chemical Industries Ltd., which has been operating the only anhydrite acid plant for 25 years, is currently investigating other processes for sulfur from anhydrite (CW, Nov. 13, '54, p. 40). But ICI's Billingham mine is the only deposit that has been

worked extensively to the present time.

A cooperative venture, owned jointly by ICI and ten other large sulfuric acid users, USAC will tap a new source of anhydrite in Cumberland. This not only increases utilization of available supplies, but also simplifies handling and shipping of the acid. Total output of the plant will be allotted to the eleven co-owners, most of whom are located in the immediate vicinity.

Saving Sulfur: Technical know-how for the Widnes plant was furnished by ICI. Employing the same process used at Billingham, the new operation will produce sulfuric acid and by-product cement clinker from anhydrite, sand, shale and coke.

The raw materials are ground and mixed in two ball mills to produce the "raw meal" to be charged to the kilns. As the raw meal passes through the



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PRODUCTION . . .

kilns, it is heated by pulverized coal entering the firing end. Solid residues form cement clinker, which is recovered as a raw material for a Portland cement plant adjacent to the acid plant.

Sulfur dioxide produced by the decomposition of the anhydrite is purified, cooled and passed on to two acid conversion plants. Both plants employ the standard contact process, are identical in every respect except that one incorporates an oleum tower. At its designed capacity, the plant will produce about 7.5% of Britain's current acid production, saving \$2 million worth of sulfur per year.

More Planned: Far from being content with this latest effort, British industry plans to continue anhydrite acid expansion. Provision was made for eventual 50% increase in the Widnes plant. And Solway Chemicals Ltd. has scheduled a 90,000 ton/year plant to go into operation at Whitehaven, Cumberland, next year. Thus, with ICI's recently expanded output (to 180,000 tons/year) of sulfuric from anhydrite and firm plans for an added 238,000 tons/year by the end of 1955, the British have declared at least partial independence of American sulfur.

EQUIPMENT . . .

Dial Blending: When an operator at United States Rubber Co.'s new Kralastic plant (Baton Rouge, La.) wants to whip up a latex blend, all he has to do is dial in the prescribed weights of the ingredients, says plant operator Naugatuck Chemical Div., and up to six different liquids will be blended automatically. The cycle of operations is so sequenced and interlocked that after the operator selects his weights no mistakes can be made.

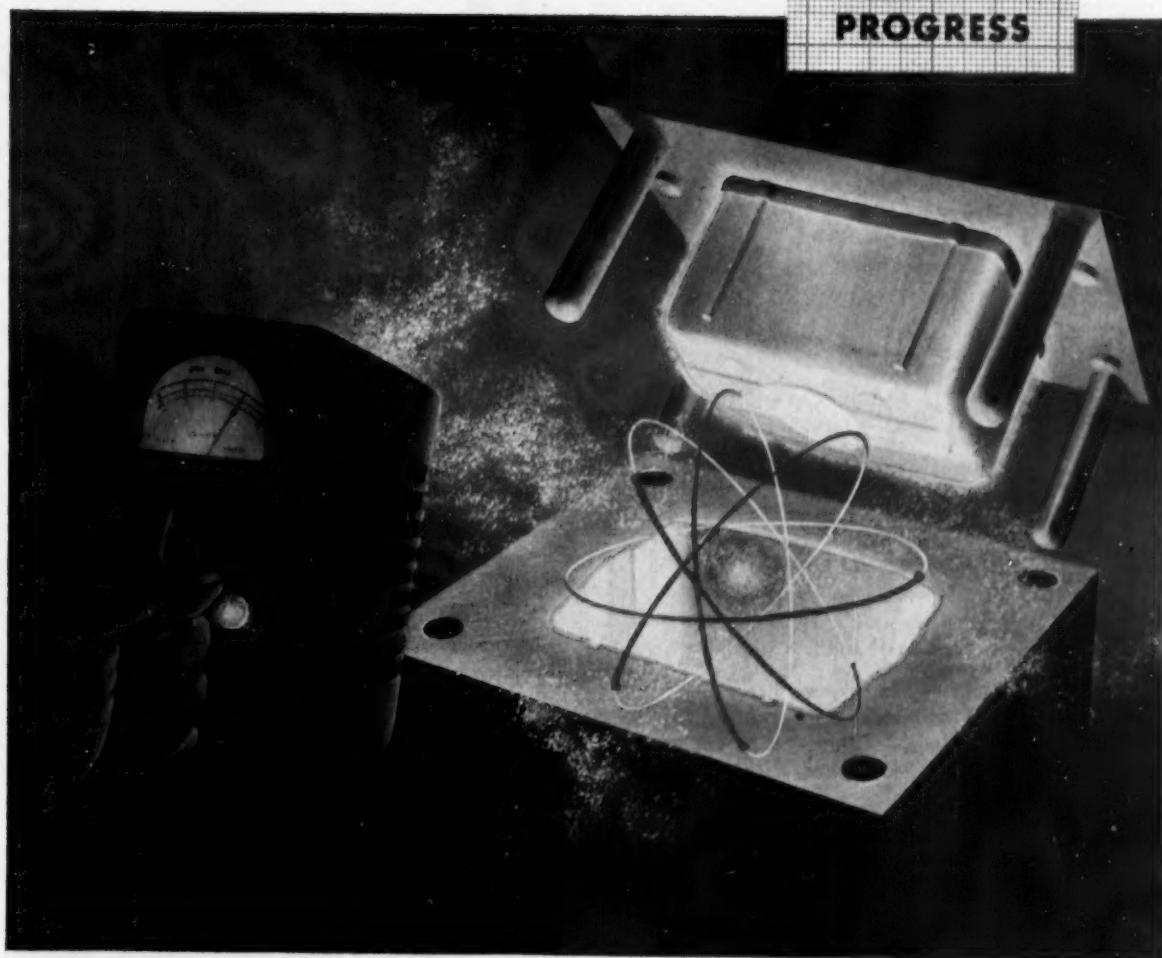
The unusual feature that underlies this operation is use of load cells to weigh and proportion the individual ingredients. Three cells are located beneath each storage tank, indicate weight changes as changes in electrical current. These electrical changes are transmitted to a remote panel control board where one operator reads the information, pushes buttons, flicks dials, and controls the entire operation. The system was designed by Richardson Scale Co. (Clifton, N.J.).

Atomic Accent: Working under United

Q.

Could chemical science create a technique to measure mold erosion that would guide development of less abrasive, mold-saving plastics compounds?

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Developed by the G-E Chemical Materials Department and General Engineering Laboratory, this new step for-

ward means progress for all—thanks to General Electric "team" research.

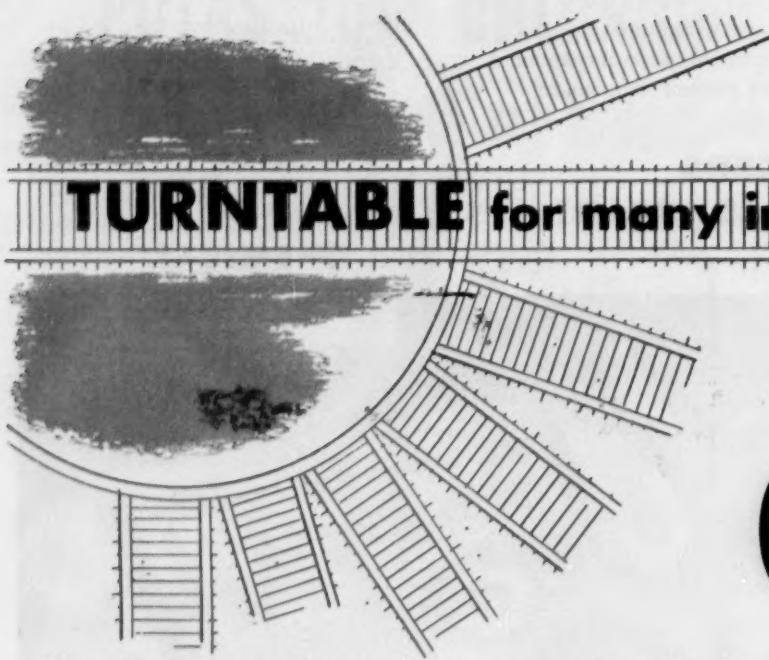


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PRODUCTION

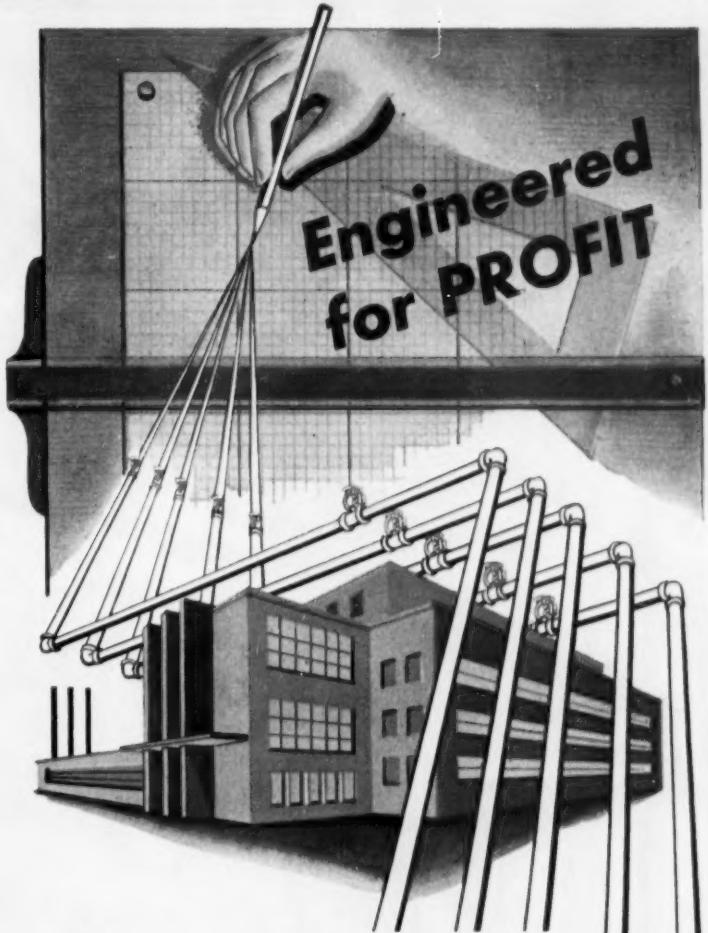
States Patent 2,633,420, Uniworld Research Corp. of America (Cleveland, O.) has developed a large group of electro steel alloys, trademarked "SR (Super Rustfree) Steels." About to be marketed, the alloys will be available in sheet, tubing, rod, wire, castings and forgings. Setting "a new standard in corrosion resistance," the alloys, claims URC, are aimed primarily at the atomic energy field, but are expected to find numerous applications in the processing industries.

Sensitive Heater: A new heat exchanger particularly applicable for handling heat-sensitive material is being introduced by Oscar Krenz, Inc. (Berkeley, Cal.). Basically a shell-and-tube unit, the heater is made of stainless steel, comes with quick-opening heads which expose all internal surfaces to facilitate cleaning. Too, provision is made for continuous condensate removal.



Salvage

PLAGUED by impurities, Mississippi Chemical Corp. (Yazoo City, Miss.) added an extra filtering step to its ammonium nitrate operation. Besides salvaging materials once sold as scrap, the Niagara filter unit removes foreign materials that lower decomposition temperatures, lead to explosions.



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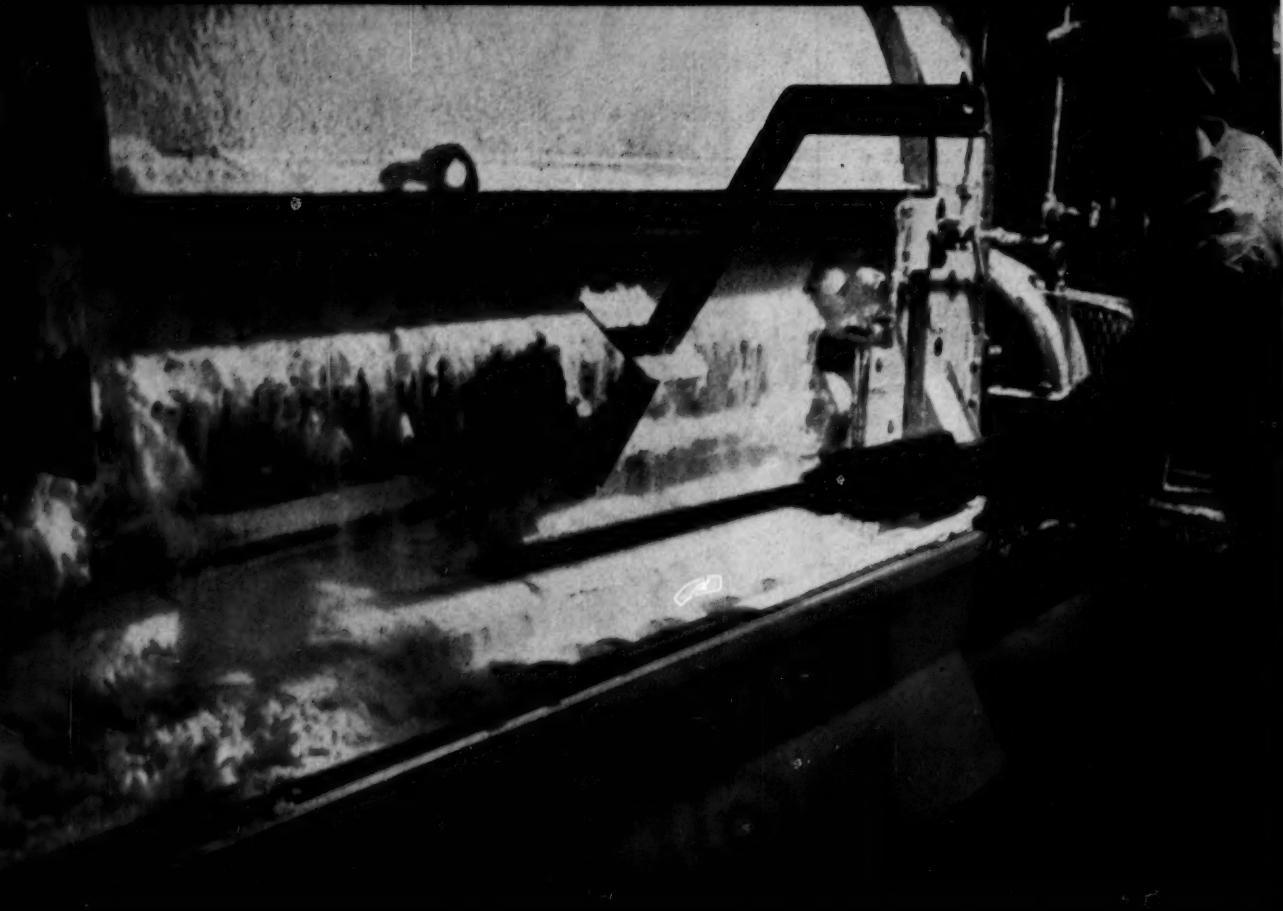
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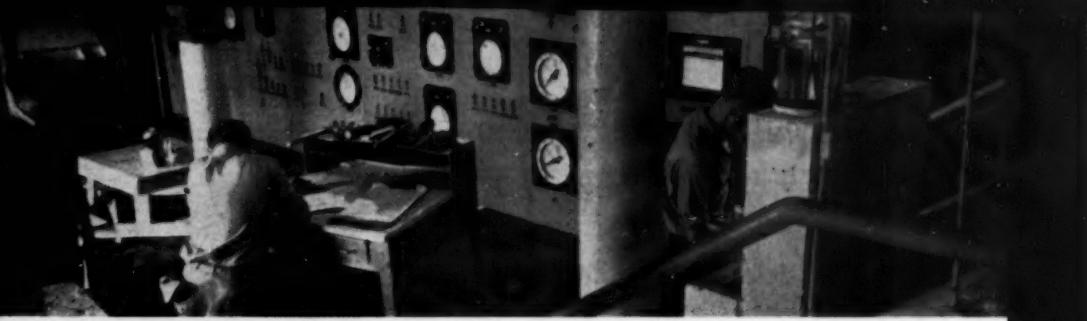
TWIN DRUM DRIERS process sodium phosphate from mixing tank and pass it into elevator which moves it into position for screening.

TAKE ADVANTAGE OF SERVICE from the TOP U.S. DETERGENT BUILDER SOURCE

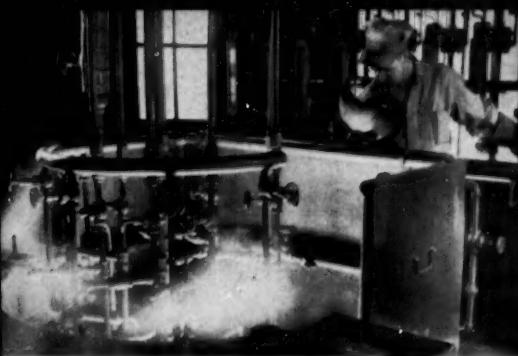
Monsanto Leads World in Sodium Phosphates Output

In Trenton, Michigan, Monsanto operates an automation-type chemical plant which annually produces millions of pounds of phosphate compounds, including STP, DSP, TSPP, TSP and MSP consumed by the detergent industry. The quantities produced make Trenton the industry's largest single source. Other compounds round out the most complete phosphate supply available anywhere in the world.

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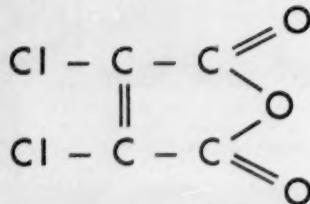


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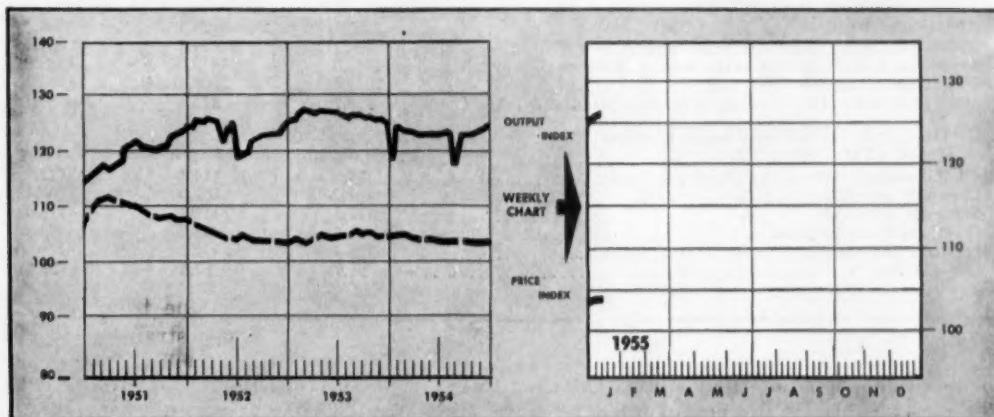
SAMPLES AND TECHNICAL DATA SHEET ON REQUEST



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M A R K E T S



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
 CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

The latest recap of data from the Rubber Manufacturers Assn. shows natural rubber consumption for last year 8% better than in '53 despite steadily rising prices of the natural latex. The record books give 597,783 l.t. of natural last year vs 553,473 in 1953.

In reverse direction, sales of all types of synthetic rubber sagged by 19%—to 635,078 l.t. last from 784,836 the year before. Over-all domestic take of natural and synthetic latices in 1954 fell off 105,448 long tons (exclusive of reclaimed rubber) to 1,232,861 long tons. But a late-'54 spurt in orders for synthetic reflects the sensitive relationship between price and demand in that 35% segment of the rubber market where natural and man-made rubber compete largely on price rather than on inherent properties.

Makers of semigelatin dynamite may well regauge future demand if this week's latest estimate for taconite is borne out. E. W. Davis, pioneer in the concentration of low-grade taconite ore, says that industry will shoot for shipments of 40 million tons of improved taconite by 1970. That's up from last year's estimate of 30 million tons by 1975.

The 40 million tons are equivalent to some 120 million tons of low-grade ore. And that represents a lot of blasting: anywhere from 0.2 to 1 lb. of explosive is used per ton of taconite ore broken, depending on pit hardness. A good average is pegged at 0.3. Explosives makers will keep an eye on plans veering toward more blasting, greater fragmentation, to cut down operating loads in crushing and grinding plants of the taconite mills.

The salt of the earth may not be enough for some crops. That's the upshot of a barrel of tests made since 1950 and summarized this week by Dr. Walter P. Mortensen, Western Washington Branch Experiment Station, Puyallup, Wash. Shorn of details the data gives these average increases in yield in bushels/acre from an application of 300 lbs. of sodium chloride per acre: 6.2 for barley, 3.3 for wheat, 2.4 for oats.

These figures underscore, however, one of the hazards of the chemical plant food industry. It has eliminated, in its synthetic formula-

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	126.7	126.5	124.2
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.3	104.3	105.1
Bituminous Coal Production (daily average, 1000 tons)	1447.0	1418.0	1363.0
Steel Ingot Production (1000 tons)	2027.0 (est)	2008.0 (act)	1802.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	358.7	373.8	368.7

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	114.9	114.8	112.9
Chemicals and Allied Products	107.0	107.0	107.1
Industrial Chemicals	117.4	117.7	118.6
Drugs and Pharmaceuticals	93.6	93.6	93.8
Fertilizer Materials	113.3	112.2	113.9
Oils and Fats	58.9	57.8	58.6

tions, some of the sodium that used to be available from animal manure. These latest findings point out that a "Salt Wanted" flag is waving over many a field where crop response to sodium fertilization could fatten a farmer's profits.

In another arena, fusel oil users' requirements continue to be unfilled. Fact is, producers see little immediate relief in sight for strapped customers. Reason: output levels of U. S. fermentation alcohol will likely remain low; whiskey production has suffered from cutbacks.

Last week the scarcity was underscored as the range in refined fusel oil prices was eliminated. Just about all makers posted the same 5¢/lb. hike that some put into effect a few weeks ago.

Some observers, then, because of the fusel shortage, expected a price rise in fermentation amyl acetate. Last week it happened. Currently the ester quotes are a nickel higher.

A surfeit of lithium derivatives? Not quite. But greater availability is behind American Potash & Chemical's 10¢/lb. drop in lithium carbonate c.l. shipments from Trona, Calif. New tag, effective this week: 90¢/lb. delivered (30,000-lb. lots).

Incidentally, American Lithium Chemicals (formed recently by AP & C), will begin producing lithium hydroxide and other lithium chemicals, at a soon-to-be-built \$6.6-million plant near San Antonio, Tex.

A multimillion-dollar hypo. That's how pesticide trade followers are describing General Services Administration's request for nearly 17 million lbs. of DDT for export. GSA isn't saying which companies are sharing the business, but you can add these names and amounts to the previous 5.58-million-lb list (*CW Market Letter*, Jan. 15), of contract awardees: (for shipment Jan. 31), Pesticide Sales Corp., 1,171,500 lbs.; Stauffer, 750,000; Powell Division, Mathieson, 560,000; Diamond, 520,000; Monsanto, 482,000; Michigan Chemical, 400,000; Niagara, 100,000.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending January 24, 1955

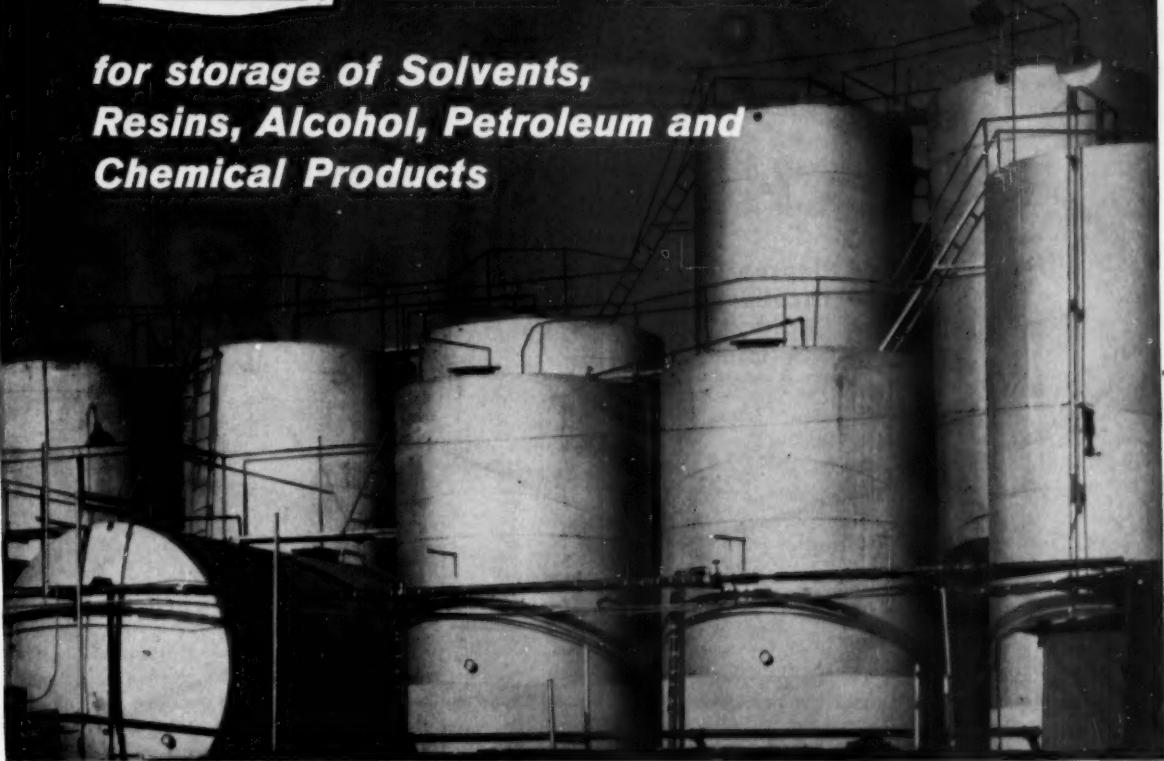
UP

	Change	New Price	Change	New Price	
Amyl acetate, ex fusel oil, tech., frt. sld., E. of Rockies, l.c.l.	\$.04	\$.22	Stearic acid, single press., bgs.	\$.005	\$.1425
Fusel oil, ref., drms., tks., del'd.05	.20	Oleic acid, single distil., tks.005	.1775

All prices per pound unless quantity is stated.

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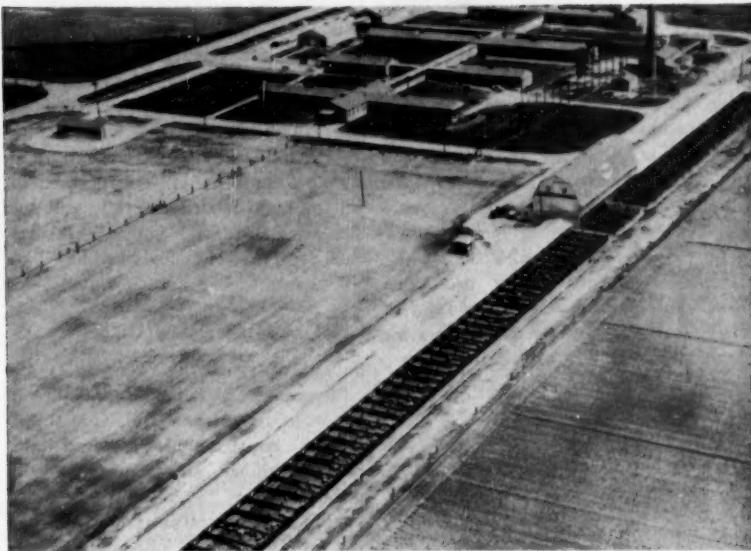
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PFIZER'S FARM: For registrants, a first-hand look at outlets for chemicals . . .

In Foods and Feeds

Late last week some 500 avid chemical market followers converged on Chicago's sumptuous Edgewater Beach hotel. The occasion: a two-day joint meeting of two top industry groups—Commercial Chemical Development and Chemical Market Research Assns. The agenda: "Chemicals in Foods and Feeds."

As an extra-curricular attraction, Chas. Pfizer & Co. extended invitations to conferees to visit, the day before the meetings opened, its sprawling 700-acre Agricultural Research and Development Farm at Vigo, near Terre Haute, Ind. (*see cut*). Here the visitors were given a concrete—and dramatic—illustration of the conference theme: the role chemicals are playing in the production of food and animal feeds.

Kicking off the Thursday symposium on the feed industry's reliance on chemicals, *Feed Age* magazine's vice-president and research director Tom Brinegar aimed some pertinent facts and figures straight at chemical marketers. He pointed out that although, in the case of most growth promoting and protective chemicals, it's a matter of mixing grams into tons, impressive trade figures underline the lucrative outlet beckoning to chemical sellers.

The feed manufacturing industry,

in a little more than a dozen years, Brinegar said, has doubled in tonnage. Actually, the growth has been steady for the last 25 years—and is continuing.

For instance, the manufactured feed industry last year edged ahead of '53 by about 4%, rolling out a volume of 35 million tons (worth more than \$3.5 billion). That tallies to approximately 30% of all the feed consumed by the nation's livestock and poultry (exclusive of roughage and pasture). Compare that with the post-World War II (1946) slice of only 20%.

Leading authorities in the field predict that this uptrending toward a steadily greater percentage will continue and that eventually between 50% and 60% of all feed will be manufactured material. Thus, aside from factors of increased population and price changes, the industry should, within the foreseeable future, blossom out to double its present size, rack up at least \$7 billion in volume.

Right now, there are no critical ingredient supply problems, and with an attractive multibillion-dollar target, chances are sales-conscious chemical hustlers will keep apace, forestall any shortages.

Target Teaser: The University of Illinois' Roger Link posed to the assembled conferees some tantalizing

problems—what veterinary medicine needs from the chemical industry. Dr. Link specifically pointed a finger at brucellosis, a cattle disease that is costing the livestock industry more than \$87 million/year. Wanted: a cure. He said that while there are agents available that seem reasonably effective in treating this disease in humans, there is no specific treatment for brucellosis in animals.

Sheep, cattle, and poultry continue to be afflicted with other diseases for which there are no effective immunizing agents or treatments. The toll is heavy, the problems critical. The solutions lie with the chemical industry.

Food Bonanza: Later in the day, chemicals and the food industry were thoroughly scouted by a panel of trade authorities. C. F. Weinrich, Cherry-Burrell Corp.'s research director, cited a private survey that shows the food industry spends some \$42-45 million/year just for cleaning chemicals; the dairy industry, included in the total, accounts for about one-third of the bill.

Weinrich harked back to the early '20s for a startling comparison. Then, he said, such cleaning agents consisted largely of trisodium phosphate, caustic soda, and soda ash, with a few chlorine products. Today the list has been extended to over a score, with many important but minor cleaning and sanitizing agents fast passing into the category meriting major consideration.

The dairy industry has successfully used acids—phosphoric, gluconic, glycolic—usually in mixtures, for removal of milk stone and water deposits. Burn-on, or protein deposits, have given way to mixtures of complex phosphates and silicates. But the dairy industry, a segment with probably the highest sanitary requirements, is but one major division of food processing. Chemical producers have long been probing markets in waste disposal, rodent and insect control, and various other phases of food sanitation.

In the same food vein, but with a different slant, Dow Chemical's Parker Frisselle discoursed on chemicals in packaging and preservation of foods—and again piqued the interest of chemical makers. Six months ago, Frisselle said, USDA's Agricultural Research Service published an extensive report titled "Losses in Agri-

M A R K E T S

Chem-men reveal new ways to use fatty alcohols

-new possibilities

- **Rancid-proof emulsifiers** are a goal of current food technology. CACHALOT brand stearyl alcohol may be a possible starting point. Uniform tonnage is available for prompt shipment.
- **Non-corrosive additives** are an essential part of modern penetrating oils. A CACHALOT oleyl alcohol with an I.V. as high as 87 looks promising. It's just one of the various NF, USP, and technical grades in the largest line of fatty alcohols available in tonnage lots of controlled uniformity.
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- **Hunting ideas?** Even if your own thoughts on fatty alcohols have not reached the talking stage, you'll find something of interest in the booklet that tells how you can use CACHALOT fatty alcohols. For your copy of "Possibilities," write: M. Michel & Company, Inc., 90 Broad Street, New York 4, N. Y.

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culture." In this report, losses that could be prevented by chemical preservatives were estimated at \$956 million, and this did not include vegetable and animal oils and fats, or meat products. So, he concludes, it is safe to say that we are working in an area where over a billion dollars annually could be saved with proper preservative chemicals.

There are literally thousands of chemicals currently being used in preserving (in one way or another) and packaging foods. Included are chemical fertilizers (which help preserve foods by producing better quality); insecticides, herbicides, fungicides, hormones, soil fumigants, water-treating chemicals such as chlorine, lime, fluoride, aluminum sulfate, and ferric chloride.

Add too, chemical packaging raw materials (e.g., resins, plasticizers), which prevent food-handling damage, mechanical damage, and the spread of spoilage organisms.

A Wide and Busy Field: Also talking at the Thursday sessions were Merck & Co.'s G. P. Whitlock (on "Vitamins and Growth Factors"); Chicago Board of Trade secretary Robert Liebenow; Victor Chemical's Rufus Barackman, whose paper centered on the functional properties of food chemicals. Principal speaker at the Thursday dinner, held in the hotel's Michigan Room, was Samuel Work, agricultural advisor, North American Regional Office, FAO.

Friday's discussions concerned the introduction of new products to the food and feed industries. The panel members: Allied Chemical's Lawrence Coleman ("Legal Requirements in the Food Industry"); Henry Smyth, Jr., Carbide and Carbon, at Mellon Institute of Industrial Research ("Toxicological Studies of Proposed Food Ingredients"); Frank Kouba, vice-president, Klau-Van Peterson-Dunlap Associates ("Marketing Channels and Methods for New Feeds"); University of Kentucky's Bruce Poundstone ("Extent and Character of Government Control of Feeds").

Co-chairmen, presiding at the symposium and panel discussion were James M. Gillet, of Victor Chemical Works, and Henry W. Dahlberg, Jr., of International Mineral & Chemical Corp.

As the CCDA-CMRA sessions drew

to close, the concluding comments of Allied's panelist, Lawrence Coleman, seemed particularly apt. Said he, "The public wants good health and the public similarly wants a copious, nutritious, palatable and attractive food supply. What the public wants, the public will get. They will get the good health and they will get the adequate food supply. It has been said that chemicals in food—like pits in prunes—are here to stay."

Cyclamate Check

Sellers of synthetic sweeteners wax enthusiastic as Pennsylvania throws out its antisweetener laws. That state's supreme court has just declared them unconstitutional and contrary to the public interest. Specifically, Pennsylvania's department of agriculture may not prohibit the sale of Sucaryl-sweetened carbonated beverages. Also barred: unusual labeling requirements.

This latest turn in the artificial sweetener tussle follows by only a month the National Research Council's Food & Nutrition Board's market-curbing words: "Pending the results of investigations now in progress to determine the safe intake levels of Sucaryl, measures to limit its use, especially in soft drinks, should be instituted."

The Food & Drug Administration may yet implement the Food & Nutrition Board's recommendations to halt usage in several ways, for example:

- Include dietary soft drinks as one



SUGARLESS SOFT DRINK: How much cyclamate per day is safe?



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Buyers' Guide

Issue of . . .

**Chemical
Week**

McGraw-Hill Publishing Company
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M A R K E T S

of the foods on which it will set standards of identity;

- Hold hearings specifically on the toxicity of Sucaryl. Purpose: to issue an order that general-purpose drinks containing this product will be liable to seizure.

In the fray shaping up, attention will be focused on the relatively new cyclohexylsulfamates rather than saccharin. Introduced in 1950, about a half-century later than saccharin (2, 3-dihydro-3-oxobenzisosulfonazole), the sodium and calcium salts of cyclohexylsulfamic acid known as cyclamates (registered as Sucaryl and manufactured by Abbott Laboratories) have won favor quickly as synthetic sweeteners. Reason: Sucaryl is more stable to boiling and acids and has less objectionable aftertaste than saccharin.

By now, of course, the use of Sucaryl is well past the experimental stage. A recent estimate counts some 200 bottling firms incorporating cyclamates in their products. Here's a rundown of some major beverage firms presently marketing Sucaryl-containing drinks: B-1 Beverage (Trim), Canada Dry Ginger Ale (Glamor Sugar Free), Cott Beverage (Cott Sugar Free), Dad's Root Beer (Dietricious Dad's), Kirsch Beverages (No-Cal), White Rock Beverages (Dietonic). Most of these companies prepare their own Sucaryl extract. But there are at least six other firms manufacturing the extract for use by bottlers.

Total quantities of these sweeteners marketed in 1953 are estimated in the 1954 study just turned out by the Food & Nutrition Board. Here is the summary for the two principal synthetics (in 1000 lbs.):

	Sucaryl	Saccharin
Fruits,		
beverages	210	21
Drug trade	210	460
Total	420	481
Glucose		
equivalents	12,600	192,400

Today the FNB evaluation holds saccharin to be relatively nontoxic, although several states prohibit use of the compound in bottled beverages. By the same token the board doesn't pin the toxic label on Sucaryl, does label the safety of the product as controversial.

A clearer light is cast on the disagreement about Sucaryl safety by

comparing the toleration level for it with that for saccharin. The human tolerance level for saccharin has been established to be at least as much as 1.0 gram/day. And that's an amount considerably greater than what would be consumed in one day by anyone sweetening his food and drink. Actually that amount corresponds to about 400 grams of sucrose. The average per capita daily consumption of sugar in the U.S. equals the sweetening power of about 0.3 gram of saccharin.

To give an equivalent sweetening with cyclamates requires about 4.3 grams. Here, then, is the crux of the uncertainty about Sucaryl: preliminary tests show that the human consumption of 5 grams/day of cyclamate affects the alimentary processes. This unknown danger level may be too close to the normal daily sucrose equivalent uptake for safety.

Cyclamate marketers will counter that no one expects the general public to switch from sugar to cyclamates entirely, nor to any other existing sweetener. So far, the best-known application of a nonnutritious synthetic sweetener has been in special diets, as for diabetics.

Nevertheless, the Food & Nutrition Board notes that the acid- and heat-stability of cyclamates fit them for a wider variety of uses than saccharin. That advantage plus its acceptable taste, increases chances that people will ingest cyclamates in excess of safe limits by normal consumption of Sucaryl-sweetened soft drinks.

A further buttress to the board's concern over excessive consumption of cyclamate sweeteners lies in human psychology. FNB observes sagely that "the potential use of the nonnutritive sweeteners is not referable alone to the amount that would replace the sugars presently used in foods and beverages. The knowledge that no sugar is used in a beverage, and that, therefore, it may be consumed without fear of adding to the caloric intake can be a strong inducement to changing usage of the beverage."

Before the facts on these and other attendant sweetener problems are in, the public can expect further results of toxicity tests, and no little debate on what may become a long fight for a fat (but nonfattening) cyclamate market.



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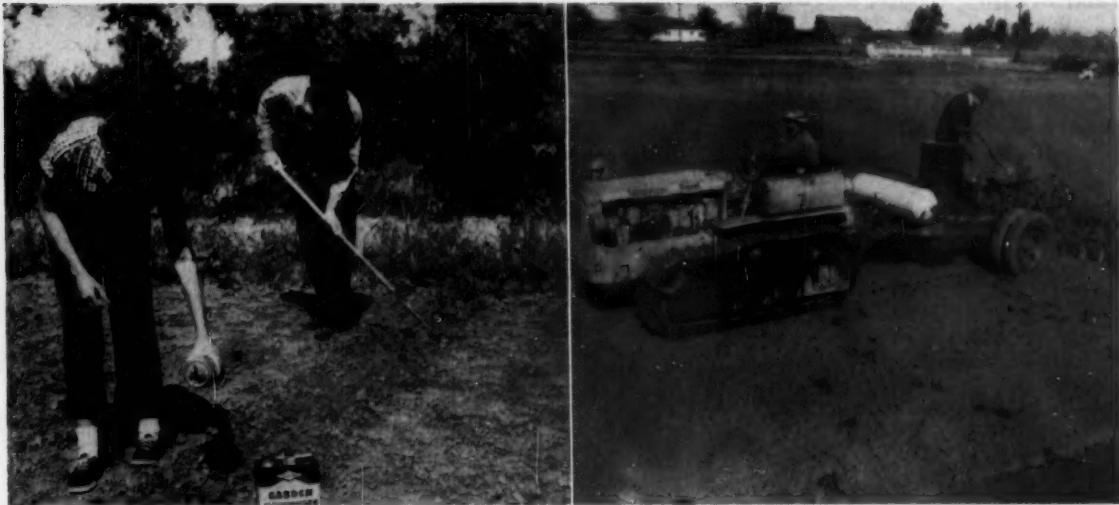
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SPECIALTIES . . .



NEMATOCIDE APPLICATION: In gardens, with a canning jar; in fields, with an ammonia rig.

Soil Pests Call for Chemicals

This week a new soil fumigant, Vapam, was introduced by Stauffer Chemical Co. to help combat nematodes—pests that are getting more attention every day. Chemically, the product is sodium N-methyl dithiocarbamate dihydrate.

Highly soluble in water, the compound's expected to rouse interest mainly because no special equipment is required in its application. According to Stauffer, the product will be offered for experimental use this year, will probably go commercial in '56.

Even if Vapam lives up to Stauffer's expectations, it'll find the going rough. Reason: two companies—Dow and Shell—are well established in the nematocide field. Furthermore, other firms are interested in joining the fray.

Both Shell and Dow are reluctant to reveal the size of the nematocide market. One reliable source, however, says it's around \$5 million. And right now, Shell and Dow are believed to have about equal shares of the business.

Actually, the problem presented by plant parasitic nematodes is so widespread that there's room for everyone. One authority says the damage they cause yearly is even greater than that caused by insects. USDA's figure is \$500 million.

Microscopic Millions: Nematodes are so small that in a single acre of cultivated soil they may number hundreds of millions (full-grown they're often less than 1/64 of an inch long, seldom more than 1/8 of an inch).

The most prevalent species is the root-knot nematode. Found chiefly in the South, it will attack almost any crop grown. Another common type is the root-lesion or "meadow nematode," which operates throughout the country. Still another is the golden nematode—it's currently causing havoc among potato plants on Long Island.*

The search for chemicals to control these soil pests began shortly after World War I. Among the first compounds tried were formaldehyde and carbon bisulfide. Both turned out to be too expensive; moreover, they didn't work very well. Next came chloropicrin. Though effective, it was also too expensive. (It's still in limited use today, principally in greenhouses.)

Dual Stand-bys: The big break came in the early '40s. At that time Shell began offering dichloropropene-dichloropropane (D-D); Dow, ethylene dibromide (EDB). Today they are the stand-bys, are competitive

*Once a plant is attacked by nematodes, either it's invaded by bacteria and fungi, or it develops galls and other abnormal growths.

costwise. With them, farmers are able to obtain protection against nematodes for about \$35/acre.

Dow sells two formulations of ethylene dibromide. Dowfume W-40 contains 41% of the chemical by weight, W-85 contains 83% by weight (the diluent in both cases is naphtha). The former is designed for direct preplanting application. The latter may be used similarly or it may first be diluted with thinners or solvents. Prices/gal.: W-40, \$2.50; W-85, \$6.

This spring, Dow will launch a campaign to make home gardeners conscious of the nematode menace. The product to be pushed is Garden Dowfume, which is essentially the 41% mixture. Packaged in 1 to 5-gal. cans, it may be dispensed in rows from ordinary fruit jars (*see cut*).

Dow also sells Dowfume MC-2, which is methyl bromide with 2% chloropicrin added as a warning agent. A gas, it must be applied under a polyethylene cover.

Shell's D-D comes in one formulation, retails for about \$1.70/gal. Like Dow, Shell would like to develop a sizable home gardener market. Its garden type is Shell Soil Fumigant.

Only a Few: The reason so few compounds are sold as nematocides is that they just happen to be the

SPECIALTIES . . .

only ones "suitable for the job," in Shell's words. Another compound Shell has high hopes for is chlorobromopropene (CBP). So far it has been used only in strawberry beds in California.

Both companies are in agreement that the ideal nematocide would be one that is not toxic to plants and tree roots, one that is easy to apply.* Today the two liquid stand-bys are applied 6-8 in. beneath the soil surface by means of hand applicators and tractors equipped for the task. One cost-saving device is the simultaneous injection of D-D or EDB with anhydrous ammonia. Since the latter is not compatible with either of the liquids, this calls for separate tubing (*see cut*).

On the Way: Despite the progress made by Shell and Dow, it's clear they'll have more competition in the future. Stauffer, for example, says its Vapam doesn't require injection, being applicable through irrigating or spray systems.

Among other companies considering entering the field with new products:

- Olin Mathieson is working on a nitrobenzene. The goal is a solid form that would be applied with an ordinary lime spreader.

- Union Carbide and Carbon has two compounds in the experimental stage. One is a 40% mixture of 1,2- and 1,4-dichlorobutenes and 60% diluent, a naphtha-type carrier, applicable by injection. The other's a dust containing a 90% concentration of 3,5-dimethyl-1,1,3,5,2H-thiadiazine-2-thione, which is mixed with the soil by plowing or disking.

- Monsanto admits researching a compound that it prefers not to identify.

- Phillips Petroleum will soon offer commercially a diluent to reduce the required dosage of ethylene dibromide and "other halogenated nematocides."

While chemical concerns are searching for better, cheaper products, USDA continues its effort to track down and identify the various species, which are believed to run into several thousands. Clearly, it's a challenging field—and for chemical companies, a profitable one.

*It would also be cheaper than current types. At present, use is pretty much restricted to high-value crops such as tobacco, truck-garden vegetables. Other customers include greenhouses and nurseries.



READYING THE FLY CHARMER: Insecticidal syrup on a plastic "tree."

Deadly Temptation for Flies

Blasted off with a promotional campaign that links it to the V-2 rocket and the atom bomb, Fly Charmer, a novel fly-killing unit, was introduced last week by Pittsburgh Coke & Chemical Co.

As a scientific development, Fly Charmer may not rank with these other triumphs of research, but there's no question that the product has merit, both as a pest control device and as an attractive chemical specialty.

And as such, PCC is launching the Charmer in national distribution this month, in restaurant supply houses, drug-, hardware, and department stores. A squad of 82 salesmen has been enlisted to spread the word. In addition, advertisements in consumer magazines such as *Life* and *Saturday Evening Post*, and radio and TV spots will back up their efforts.

Schrader's Baby: Essentially the Charmer is a device to lure flies to where they can pick up a fatal dose of the new insecticide, L 13/59.*

Almost as essential as the insecticide, however, is the unit dispensing it. It was worked out in the U.S. by Pittsburgh Coke, and is an ingenious combination of several plastics. The flower-

pot-shaped base (white) and cap (red) are polyethylene. The "pylon," which can be lowered into the base, is polystyrene.

Unit is shipped dry, with insecticide crystals (2% L 13/59, the rest attractant and inert ingredients) in a separate bottle. User adds water to the bottle, then pours the poison solution into the base. The pylon is immersed in the syrup, then pulled into the upright, pagoda-like position. (Pittsburgh Coke's tests show flies like the dark-colored plastic, prefer to land on horizontal surfaces.)

Flies are lured by the sweet, slightly blue solution that clings to the discs on the pylon. Immersing the pylon in the solution once or twice a day is enough to keep the Charmer working—one is suggested per 2000-eu. ft. room.

The complete unit is being sold in this country and Canada (by Green Cross Products) for \$1.98. Refills of the chemical are sold for 98¢.

Silicones for Cosmetics: General Electric has come out with a family of silicones for use in cosmetic products. Designated Velasil silicones, they are said (1) to increase water repellancy and (2) to give protective action against detergents plus common water-borne irritants (CW, July 17, p. 52).

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GE reports they may be employed in any standard formulation.

Dip Varnish: A modified silicone dipping and impregnating varnish, Sylkyd 1400 Varnish, has been introduced by Dow Corning Corp. for electrical equipment. It is said to combine good heat stability with high bond strength and resistance to moisture, oil and solvents.

\$500,000 Budget: This spring and summer d-Con Co., Inc. (Chicago) will spend some \$500,000 to push its new fly killer, Fli-Con. It's being introduced in three forms—a ready mix, a concentrate, and a water bait. One pound of the mix will cover 25,000 sq. ft., d-Con claims.

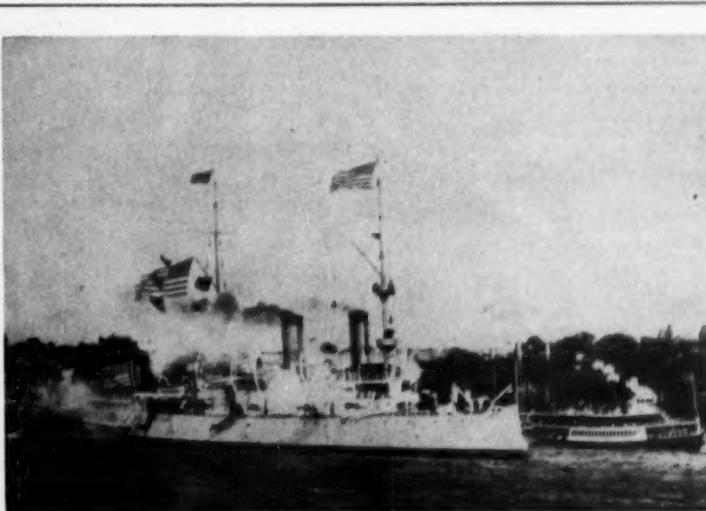
Three Times Longer: A scouring pad said to have three times the life of conventional pads is now being marketed by Gabriel Williams Co., Inc.

(Brooklyn). It's a cellulose sponge with abrasives bound to its scouring surface by Geon vinyl plastic. Name: OFF-F.

Super Jet: An improved black lacquer dispersion has been marketed by Binney & Smith, Inc. (New York), to replace its DC Cobrac—the new product is DCY Cobrac. It can be substituted directly for the older material, Binney & Smith says, and will be supplied on all orders for the DC, starting this month.

PVAc Finish: For nylon hosiery, and other nylon products, as well as cotton and rayons, Hart Products Corp. (New York) is now selling a polyvinyl acetate emulsion, Harto-Resin PC. These emulsions leave a clear, colorless finish.

Combination Cleaner: By combining Stoddard solvent (30-60 parts) with a polyoxyalkylene ether of an alkyl



Time Takes Its Toll

STEAMING into port in its days of glory is the dreadnaught *USS Olympia*. (It was on the *Olympia*, during the Spanish-American War, that Admiral George Dewey gave his famous command, "You may fire when ready, Gridley.")

Now, it looks as if time will do what no enemy ship could—rust and corrosion have virtually sunk the

proud vessel at its berth in the Philadelphia navy base.

Fortunately, there is still hope for the *Olympia*, though: historically minded citizens are trying to raise funds to have the hull "voids" (such as space between the double bottoms) filled with phenolic foam, which will keep her afloat, make her safe once more for visitors.

SPECIALTIES . . .

phenol, Robert Echols (El Cerrito, Calif.) has come up with a stable dry-cleaning solution (U.S. Pat. 2,697,075, assigned to the California Research Corp., San Francisco).

Clean Sweep: Designed to insure clean sweeping, without softening asphaltic or resinous surfaces, a floor-sweeping compound has been worked out by Clarence C. Week (Long Branch, Ontario, Canada). The compound (U.S. Pat. 2,692,861, assigned to The Patent and Licensing Corp., New York) consists of a crumbling powder treated with a nonparaffinic oil.

Fast Flooring: Swift-Floor Medium is a recently developed resurfacing ma-

terial sold by the Monroe Company, Inc. (Cleveland). Designed as a companion product to Monroe's previously offered Swift-Floor, it is said to dry in 60 seconds, require little rolling or tamping.

Chemical Paving

Still topping the list of chemical soil stabilizers, according to Dow's R. C. Mainfort, are calcium acrylate (activated with ammonium persulfate and sodium thiosulfate) and a furfural-aniline combination. Mainfort summarized work on chemical soil stabilizers last fortnight before the annual meeting of the Highway Research Board.

The present heavy emphasis on fed-

eral government roadbuilding spotlights the need for chemicals to improve subsurface structure, as well as provide actual roadways. But as Mainfort points out, currently available systems, though they have real value in military applications, are still comparatively costly.

The calcium acrylate treatment, developed by the Army, is particularly useful in stabilizing wet soils. The furfural-aniline system, a Navy project, is well regarded for firming beach sands, and waterproofing soil structure. But both are too expensive to use for general civilian construction of airports and highways. And so far, these appear to be among the most effective materials at anything approaching useful costs.

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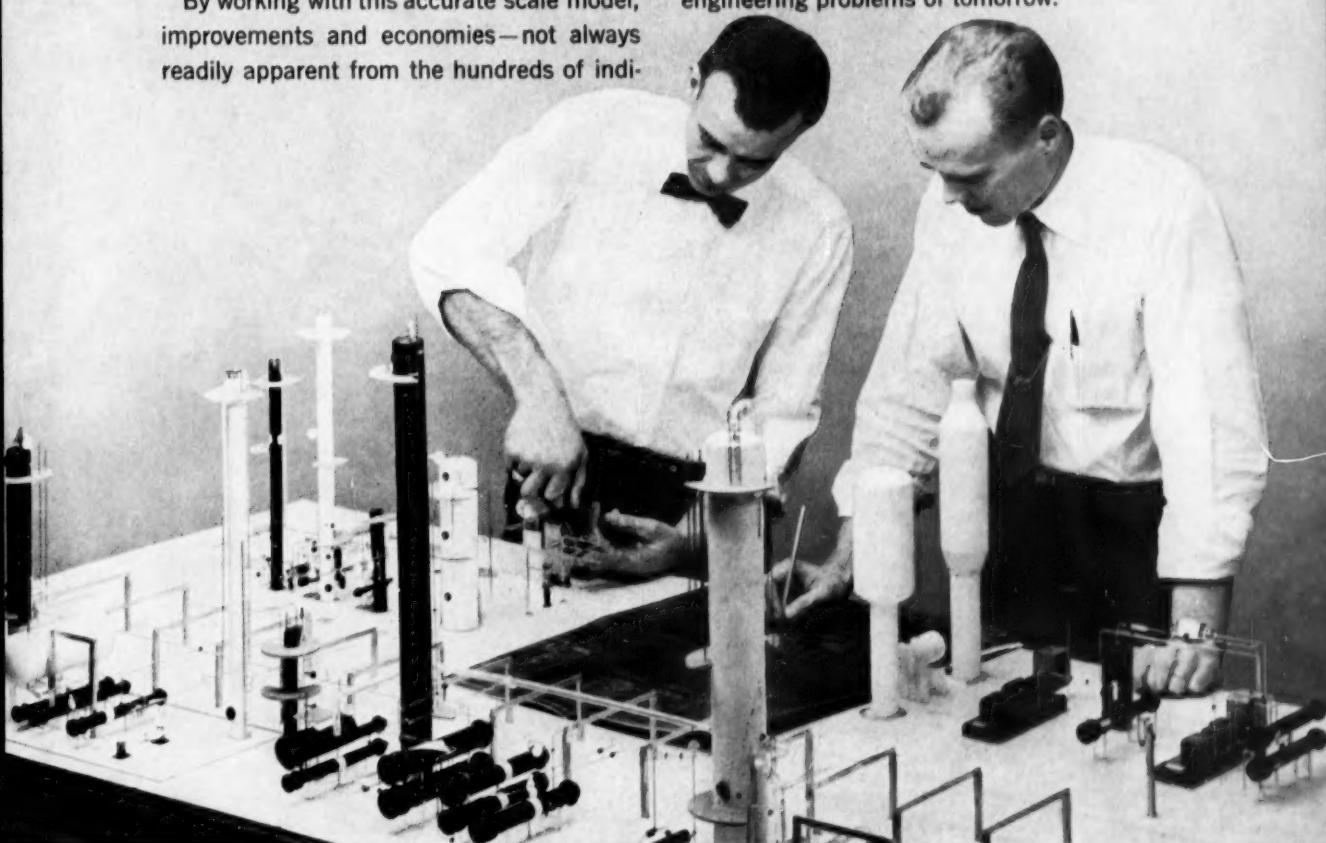
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